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MAY, 1921

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association

VOL. IV MAY, 1921 No. 5

ORIGINAL ARTICLES

CLEFT PALATE AND HARELIP PROCEDURES*

TRUMAN W. BROPHY, M. D., D. D. S.
Chicago, Ill.

There are two objects to be attained in cleft palate operations: Normal anatomical relations, and correct function. The first step towards normal anatomy is to make use of the separated bones in such a way as to establish just as nearly as possible a normal palatal arch. Now, how can this be done. It certainly cannot be done by closing the lip over the greater congenital deformity and concealing it from view, leaving the patient deformed, to remain so to the end of life. A surgeon who would close the lip first and partially cover the deformity, does his patient though unconsciously no doubt an injustice, because the separated bones, no matter how much traction is made by the obicularis oris muscle in moving them together, will remain separated to the end of life.

If the cleft of the palate is single and if the lip is closed, the long segment of bone will protrude far beyond the short segment and the edges of the alveolar processes will not meet, except in rare cases. In nearly all cases treated in this manner, there is an opening between the mouth and nose where no attempt at union has been made. To so operate is similar to closing a wound over a fracture and allowing the fracture to go without a splint. It is unnecessary to state that no surgeon would operate without adjusting the fragments and immobilizing them in the doing of this operation. Cleft palate surgery, when the palate is completely separated, is *always* bone surgery and the time must come when all will appreciate this fact and practice this course of procedure in order to secure normality. If the surgeon succeeds in getting the lip closed over an extensively protruding premaxillary bone, still the deformity exists within the mouth, though covered up, and the patient will have a monkey-face so long as he lives.

When well understood, I regard the moving of the bones into proximity as one of the most satisfactory operations in surgery. Men who are not familiar with this work and who have not followed the hospital records, have claimed that the mortality is very high. Out of 577 patients under one year operated during the past five years, for the approximation of the maxillary bones and the carrying of the premaxillary bones into proper position, I have lost 16 patients. I attribute the low mortality of 2.77 per cent in these cases to the fact that shock is less severe following an operation at this age than it would be between 12 and 18 months, and further to the fact that I will not operate upon any patient unless it is in satisfactory condition. Patients of this age must be in the hospital under observation not less than 3 days, have a physical examination and must be gaining in weight.

A study of the thymus gland is of great importance. We know that status thymico-lymphaticus is a serious menace to surgical procedure in young children. I do not regard the surgical risk as great in infants under 5 months as between 6 months and 3 years. In December 1919 I lost a patient 18 months old, following an operation. The patient had been prepared as usual. It was large and vigorous. The child died suddenly. The autopsy revealed an enlarged thymus gland and status lymphaticus. As a precaution against such unfortunate events I have adopted as a routine measure the making of a radiograph of the child's chest so as to determine whether the thymus is of normal size. Percussion will fairly well outline the borders of the gland, but the x-ray is conclusive. If the gland is enlarged, operation should be deferred.

*Read before the Southern Minnesota Medical Association, Mankato, November, 1920.

Often one treatment of x-ray will be sufficient to reduce the gland to normal size, after which the operation may be made, usually within 6 weeks.

Acidosis is responsible for many ailments. An examination of the urine should be, of course, included in the physical examination, but it is always well to anticipate acidosis and make use of sodium bicarbonate in small doses frequently given, for several days before operation. A dram may be dissolved in one-half pint of water and a teaspoonful given to young infants every two hours. We irrigate the mouth and spray the nose with a solution of boracic acid.

Formerly it was my custom to operate in the morning, the patient being allowed no food. More recently it has been my practice to give children a half ration breakfast at about 5:30 a. m., operating at 9:30. I believe that the food received at this time is of great advantage in giving the child strength and better fitting him for the anesthetic.

The anesthetic used is ether, although I prefer chloroform. But the general objection to chloroform and the difficulty in having it administered properly has led me to use ether exclusively. I would like to say in this connection that chloroform, properly administered, is, in my opinion, the best anesthetic known. Medical teaching in this country is, however, against it. In fact, our medical institutions do not teach its use and it would not be fair to a patient to have an anesthetic administered that is not understood. In my experience in France during the war, I never saw any other anesthetic than chloroform administered in the French and English hospitals.

In 1885, having become familiar with the methods employed generally by surgeons throughout the world and having studied the deformity from every point of view, I concluded that the time best suited to close a cleft palate was as early after birth as it was possible to operate. The basis of my belief was that a cleft might be closed by a little pressure immediately after birth, whereas six months later the bones would be so ossified that the moving of them together would be attended with difficulty and, besides, the results of the work would not be as satisfactory. A cleft palate is a fissure, a separation, nearly always, of well developed parts, not (with few exceptions) the result of *arrested development, nor failure of the normal quantity of tissue to enter into its structure.* It is practically a wound. I hold, therefore, that *it should be closed in early infancy when it can be accomplished most easily.* Our text books and professors of surgery, with few exceptions, teach, if they teach it at all, that congenital harelip should be operated upon in early infancy and that no attempt should be made to close a cleft palate until the child is several years old. The practice and teachings of surgeons of highest repute have led medical men, in some instances, to advise those seeking information as to the most desirable time to operate for harelip and cleft palate, to have the lip operation performed at once and to postpone the palate operation until the child is from 3 to 10 years old. I have endeavored not only to overcome the objections raised to early operations, but also to avoid difficulties with which the older surgeons contended.

Fig 1. The monkey-face. This child had protruding premaxillary bones. An effort was made to close the lip over them, with the result illustrated. The boy could not close the lip except with the greatest difficulty. His mouth was constantly open. The deformity following operation was nearly as great as the one which the surgeon undertook to correct.

After 35 years of study and clinical experience, I am satisfied that the most desirable time for operating upon cleft palate is within three months after birth. At that time we are able to secure more satisfactory results than in later life and we also avoid the objections usually raised by surgical writers.

Within the past four years I have ventured to approximate the bones that were widely separated, with protruding premaxillary bones, in patients beyond infancy. A patient 5 years old who came to me, with extensively protruding premaxillary bones and a complete cleft, was treated by moving the bones backward and approximating them, afterwards closing the lip. A child of 14 months who came into my practice about 2 years ago, had an extensive cleft of the palate in the median line. There was a complete separation of the premaxillary bones, leaving a central incisor tooth on each side of the fissure. The upper arch was so broad that the teeth of the lower arch were completely telescoped by the upper, the lower teeth coming in contact with the mucosa covering the hard palate. This was indeed a problem. I resolved to approximate the bones. I carried 6 strong silver wire sutures through the maxillary bones, using 2 heavy lead plates (No. 13 American gauge), each perforated with 3 holes admitting 2 wires through each hole. These wires were brought together and twisted. As much force was used as I thought advisable, and I could see a slight moving of the bones under pressure. Ten days later, the patient was again anesthetized, the slack taken out of the wires and they were twisted again. So, by twisting the wires about every

Fig. 2. Profile of same child, showing the extreme prominence of the lip, due to a misconception of the proper treatment of the protruding premaxiallary bones. The surgeon did not realize that the protruding premaxillae called for bone surgery, which should always be the first step in correcting the deformity.

Fig. 3. The protruding premaxillary bones in this child were moved back into their correct position by making an oblique incision through the vomer. The edges were freshened, as well as the edges of the maxillary bones. Two strong wires were carried through the maxillary bones, and anterior to the premaxillary bones, and anterior to the premaxillary bones beneath the maxillary periosteum. These bones were firmly immobilized. The soft parts over the freshened surfaces of the bones were sutured with horse hair. Fifteen months later, the imperfections of the lip were removed, the vermilion border corrected and the dilated nostrils were normal. From the ugly appearance that he presented in Fig. 1, we have in Fig. 3 a handsome boy.

10 days or 2 weeks, extending over a period of 3½ months, I was enabled to bring the bones into proximity.

I am now convinced that any patient up to 15 or 20 years may have these broadly separated bones approximated if the surgeon will take time enough, by moving them little by little and from time to time. We know that the orthodontist is able, by moving teeth slowly, to bring them into almost any position desired. The same is true of bone. In fact, bone having in it a large amount of cancellated tissue, is far more easily moved than teeth.

Fig. 4. Here we have a profile showing the great improvement made in this lad by moving the bones into proper position and correcting the lip.

Nevertheless, in the light of surgical advancement and development of modern methods of procedure, *no cleft palate patient should be permitted to attain an age when speech is attempted without having an operation performed and the defect removed.* Students must no longer be taught methods which should be obsolete in this field of surgery; they must not permit the deformity to remain without attention; they must qualify themselves in modern methods in this special surgical work as they do in other departments of surgery. Having, then, in mind the anatomical defects of the palate, they should seek to overcome them, *bring the abnormal anatomical parts in normality and thus establish more perfect functional results.*

Fig. 5. Extensive protrusion of premaxillary bones, double harelip and cleft of the palate.

The second object of palatal surgery is correct function. We cannot secure function unless we secure a good palate—a palate long enough to pass backward to the postpharyngeal wall; the posterior palate must be safe, flexible and resilient. Such a palate cannot be secured when large lateral incisions with a view to relieving tension are made in its structure. The Langenback incisions should not be made. They are unnecessary. There are nine reasons why these incisions should not be made and not *one* good one why they should be made. With lead plates, wire tension sutures and horsehair coaptation sutures, a good palate may be made. When the palate fails to unite, it is due usually to a failure in the operation. If the palate is raised back as far as the styloid process of the temporal bone and hamular process of the sphenoid bone, it will be redundant. When denuded from the hard palate it will drop down and the edges meet

without tension. After adults and younger persons have been operated, they often think they should speak perfectly at once. It will be quite impossible, in the time at my command, to enter upon a description of the methods employed in training a patient, who has been operated after defective speech habits have been acquired, to speak well.

The study of eugenics is intensely interesting, and points unerringly to the inheritance of congenital defects. In a communication recently received from Dr. Chas. B. Davenport, Director of

Fig. 6. Interior of mouth, showing protrusion of bones, double harelip and cleft palate. A pulpless, loose tooth is visible. This was removed before the first operation.

the Eugenics Record Office, Cold Springs Harbor, Long Island, New York, he says:

"Of the 2,500,000 men examined (for army service), including 500,000 rejected, there were recorded 1183 cases of cleft palate and 283 of harelip." It would be impossible to enumerate all the states where statistics have been gathered. I give only a few.

State	Cases	per M
Vermont	13	1.55
Maine	29	1.49
North Dakota	18	1.01
Illinois	68	.38
Arkansas	7	.16

Fig. 7. Premaxillary bones brought into correct position, the edges freshened in both premaxillary and maxillary bones, perfectly immobilized by wiring them in place.

"The defect is commonest in agricultural sections of the north, 0.88 per M.; in negro sections, 0.35 per M.; in mountain sections, 0.59 per M., and in desert sections, 0.33 per M."

In considering these figures regarding the frequency of cleft palate, we must remember that those included were young men undergoing examination for the army, between the ages of 21 and 32 and we do not take into account the enormous group from early infancy to 21. It is only fair to estimate that a far greater number of cleft palates are under the age of 21 than over. Christopher Heath, the English surgeon, made the statement many years ago that nearly 50 per cent of cleft palate infants died of starvation since they could not perform the function of deglutition. This being the case, instead of there being 1183 cases of cleft palate in the

Fig. 8. Profile of boy after the premaxillary bones were united to the maxillary bones.

Fig. 9. Front view, showing, double harelip, and broadly flattened nose, the breadth being greater than the length.

United States, there would be many, many times that number.

It is well understood that complicated, tripartite cleft palate, with harelip, is the most conspicuous deformity known to mankind, and realizing the fact that this deformity is the least understood and the most unsatisfactorily treated in the whole field of surgery, we seek for a reason. There is one, which must be apparent to every observing surgeon. In 1915 I requested my publishers, P. Blakiston's Son & Company, to write to the leading medical colleges of the U. S. and ask the following questions: "Have you a Professor of Oral Surgery?" and "How many lecture hours per year and how many clinical hours in Oral Surgery are given?" Out of 64 replies, 6 were in the affirmative as to having a chair of oral surgery. This accounts for the apathy on the part of medical practitioners generally, in regard to this subject, since they have not, as medical students, had an opportunity to learn.

I was recently asked by a distinguished educator, not a physician, what I thought was most needed in the department of medicine. I said to him, "Doctor, my answer is very plain. What the medical student most needs, in my opinion, is to learn how to take care of his patients." So long as only 6 out of 64 of our foremost medical colleges have in them chairs of oral surgery; so long as the interns, who are among the best men from our colleges, have no knowledge of the work we are here discussing, we can expect only such disastrous results as have been exhibited here today, in many cases, instead of having these deformities treated with the same knowledge, the same care and the same skill as we get in the treatment of other ailments and deformities of mankind. I do not wish to charge the young practitioner with negligence in this work because I know that if an opportunity had been placed before him and if he had been required to pursue these studies, he would at least recognize and follow a practice that would not leave the patients, as we sometimes see, in a worse condition than they were before they were operated.

Higher medical education—increasing the requirements for admission and for premedical

training, increasing the facilities for laboratory work, strengthening the faculties by bringing in men who have been thoroughly trained in their respective departments—has advanced most satisfactorily during the past decade, but the clinical facilities have not kept pace; post graduate work, while not up to the highest standard, has done much to aid the practitioner in the care of his patient. Why should oral surgery not be included?

It must be apparent to all that the greatest obstacle in the way of success in the field of oral surgery, and I might say oral pathology and surgery, lies in the fact that, as I have pointed out, there is failure on the part of medical colleges to teach thoroughly these important subjects. The many mistakes made in this field must cease;

Fig. 10. Nose lifted, after the lip was closed.

deformed humanity is entitled to better surgical results.

Dr. Chas. Mayo said in Chicago some years ago when addressing the Chicago Dental Society, "The next great move in preventive medicine will be accomplished by the dentists of our country. Will you do it?" To do it calls for a thorough training not only in dental histology, physiology, anatomy and pathology, but they must do more than this. They must have a thorough training in general pathology and antiseptic surgery.

Fig. 11. Construction of palate, lip and nose completed. It will be seen that the nose in Fig. 9 is nearly twice as broad as in Fig. 11.

When the dental colleges of our country come up to this high standard suggested by Doctor Mayo; when the medical institutions demand as a part of the curriculum a training as thorough in oral pathology and surgery as they do in the departments of the eye, ear, nose, throat and cutaneous diseases, et cetera,—then, the innumerable errors now committed in the management of harelip and cleft palate will end.

DISCUSSION OF PAPERS BY DRS. BROPHY AND SHEARER

DR. GORDON B. NEW, Rochester: It seems almost superfluous to attempt to discuss a paper by Dr. Brophy on harelip and cleft palate work. I know of no man in this country who stands higher in the estimation of the profession in this class of work than Dr. Brophy.

I believe the principles he has outlined should be followed. However, in following them our method has been a little different, but I believe we have accomplished the same results.

We bring the lip together before the child is three

Fig. 12. View of cleft in central line, a central incisor tooth being on each side of the fissure.

Fig. 13. Parts approximated, by the use of silver wire and lead plates.

months old. In doing this the alveolar process and the upper jaw are brought together, the results are identical with those shown in the pictures without the use of mechanical measures. If the child does not come to us until it is six or eight months old, some mechanical measure is necessary to bring the parts together. If the child is seen early enough, bringing the lip together will accomplish the same results. By comparing the plaster casts of the jaws before operation and the casts when the child comes back within a year for operation on the palate, the results are shown to be identical.

The operation on the palate should be performed before the child is fourteen months old; before the child begins to talk. We condemn lateral incisions; they cut off the blood supply which is the essential in cleft palate operations.

Another point of importance is to free the palate by cutting across the aponeurosis at the juncture of the hard palate with the soft palate.

With regard to the lateral incision: I make a small nick mesially to the alveolar process to allow the elevator to pass down to the bone and so facilitate elevation of the hard palate, which can be done much more readily in this way than by elevating it from the mesial margin.

DR. R. E. FARR, Minneapolis: I am sure we have all enjoyed the illustrated paper by Dr. Brophy. It was my good fortune to have had a chance to study with him and to have stood at his elbow for considerable periods of time, at intervals, and to go to his clinic and see, not infrequently, twenty-five of these cases with the nose in the center line, and later see those twenty-five cases come out with perfectly healed palates. It was astonishing to me to see him get primary union in so many of these cases I saw him operate upon.

At the Minnesota State Medical Association meeting this year we were told that cleft palate procedures had been standardized. At the same time the reader of the paper and the discussers of it stated that this standardization consists of closing the lip in early infancy and not in reposing the bones. Dr.

Fig. 14. Plaster cast showing (a) Complete separation of palate; (b) Anterior bones of palate united.

Brophy comes along and gives us another standard. Which one are we to accept and which one will live?

As has been stated here, the nose is always to one side—I refer to the cases with single cleft—and the middle of the face will bisect the ala of the affected side.

A number of years ago I had a number of young adults come to me who were operated upon in infancy. I had four of these photographs, but misplaced them, showing the patient holding his finger between the alveolar processes in front. The space between these processes was from one-quarter to one-half inch wide. These lips had been closed in infancy, between the ages of eleven days and six weeks. They do not always come together and you cannot have bony union because you have mucous membrane intervening between the alveolar processes. (Here Dr. Farr showed slides of cases on which he had operated, and described the method of operating.)

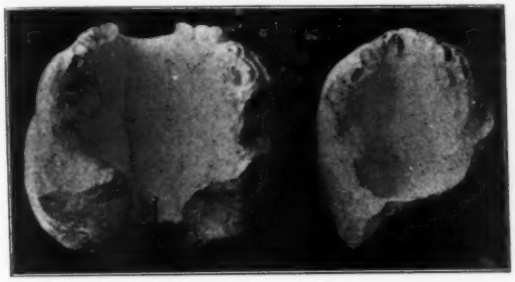


Fig. 15. (a) Plaster cast showing separation of palate (b) cast showing union of hard and soft palate.

DR. ALFRED T. RASMUSSEN, LaCrosse, Wisconsin: Much as I would like to be a listener only, I cannot refrain from getting to my feet to discuss this important subject. One or both of the essayists said that cleft palate and harelip is the most conspicuous of all deformities to which the human race is heir. It is more than this. It is undoubtedly the most hideous congenital deformity we have to deal with. A man may be minus an arm or a leg; he may be deformed in almost any other way, and yet he can associate with other people. But the poor unfortunate who has a cleft palate and harelip is ostracized and avoided by all because of the mental depression which the sight of it causes.

Fig. 16. (a) Manner of occlusion of upper with lower jaw, prior to operation; (b) upper and lower teeth occluding properly after operation.

Fig. 17. Photograph of child before operation.

I was very glad indeed that both essayists called attention to the fact that surgery of the palate is bone surgery *per se*. That I believe should be so drilled into the minds of surgeons that when they think of a cleft palate operation they think of bone surgery. In all bone surgery it is absolutely essential that the various steps be taken in their proper sequence. What surgeon, if he had a wound to treat, in which there were misplaced segments of bone, would close the wound, with no thought of placing such bones in their proper relation? Place these bones, viz. the bones of the arch, where nature intended them to be, and when you have them there, with the cancellous bone in apposition, immobilize the parts and hold them there until nature has affected a bony union. You expect to get this result in other bones; you may expect to get it in the bones of the palate. We do get it. Later, when we have a normal bony arch the subsequent operations for the closure of the lip, soft palate and correction of the nose may be done in their proper order.

I want to mention one point which I was in hopes one of the essayists would mention in connection with the mistake we have seen so often of closing the lip first. The sole object of the lip operation is to make a lip as nature intended it to be for that individual. That cannot be done unless there is a normal arch. Let me repeat, it is a surgical

Fig. 18. Photograph of child after operation.

impossibility to construct a normal lip over an abnormal arch. I hope that is clear. When an attempt is made to close the lip over the divided bones as we find them, in any of the various types of cleft, the best that can possibly result is a tense band of soft tissue, more or less cicatricial in nature, stretched across the anterior portion of the separated bones. We have seen the results of this mistake so often. In many cases an attempt is later made, with more or less success, to reconstruct these lips. This is always a very difficult task at the best, due to having a great mass of scar tissue in place of the normal structure of the lip.

Let me say further, and I trust I may be pardoned for saying this, that just as long as surgeons persist in closing the lip first, just so long there will be work for the specialist, later on in the life of the patient, to do what he can towards forming a lip out of this dense mass of scar tissue. I feel very keenly upon this for the patients appearance throughout his whole life depends upon the lip operation being so done that the lip will be normal.

Another thing: let no surgeon delude himself by taking a large dose of soothing syrup in the form of "Closing the lip first". We know the tremendous deformity we have in these cases. The bony parts are not in proper relation. Closing the lip over such malposed bones will not bring them into proper position. True, the relation of the bony structures may in time be somewhat changed but there will never be union of the parts. In some parts the deformity is usually increased, notably the tuberosities. They are often wider apart than before. This makes much more difficult the closure of the posterior part of the palate. Such procedure is like closing the door to the skeleton closet; the skeleton still remains. So does the deformity.

I want to say just a word or two about the soft palate. Function is most important. No soft palate will function properly unless it is normal. What is a normal soft palate? It is a soft, flexible, resilient palate of the proper size and shape, in which the anatomical structures have not been disturbed. This cannot be if lateral incisions have been made in the soft palate. If the tensor palati or any of the palatine muscles are divided, the function of the palate is lost due to the lack of muscular action. Such incisions when made become closed by ciatricial tissue which in turn contracts, thereby producing a hard, tense, "Drumhead" palate, which cannot function. No surgeon wants to produce such results. Furthermore, when once such a condition is established, we know of no way of reestablishing normality. Therefore I say, with all the emphasis at my command, *never make any lateral incisions in the soft palate.*

DR. BROPHY (closing the discussion): I have been treated so kindly ever since I came to Mankato, especially this afternoon, that I do not feel like consuming any more time of the Association. If I have said anything this afternoon which will set men to thinking who have not heretofore given this subject a great deal of thought, I shall feel amply repaid. If I have said anything that will lead surgeons and physicians to see to it that young children are supplied with the proper facilities to take nourishment from the means I have suggested, which are not theoretical, I know it will prove of great value. I am satisfied that the lives of these children can be saved if they can be nourished during the first three or four months of life. The fact of the matter is that these little ones come to us weighing in a month or so less than when they were born. They come to us suffering from gastroenteritis because they have not received the proper food, and what they did have they have not been able to take and dispose of properly, and they come to us as sick children. We try to do our best for them, in order to bring them into a state of health. Now and then, one dies before we can operate, because we cannot bring them up to a normal condition, but this is largely due to the fact that they have not been properly nourished. These children should be operated on as early as they can be, or as soon as they can be put in good health. Then the most important thing of all is to remember that we do not want to leave the patient with a crooked nose. We do not want to have the patient with an irregularly shaped jaw. It is very essential for us to put the bones where they belong and hold them until union takes place. You cannot call this reconstructive surgery. It is constructive

surgery. We cannot reconstruct a thing that has never existed. We construct a palate out of what we find, pull it together, and unite it with great satisfaction after the manner described by Dr. Shearer.

Again, I wish to express my thanks to the offices of the society for the courtesies and kindnesses that have been extended to me.

CLEFT PALATE AND HARELIP*

WILLIAM LETE SHEARER, B. S., M. D., D. D. S.
Omaha, Neb.

Congenital cleft palate accompanied with cleft of the lip, either single or double, is unquestionably one of the most conspicuous deformities known to the medical world. It is a most distressing calamity to the parents, and, when not successfully corrected, it is a source of grief, not only to them, but also to the child all through life; so much so to the child, that he will shun society. As a result, his ability to earn a livelihood later in life is greatly lessened, and he becomes more or less a burden to friends and society.

Much as has been written upon this subject it is very evident from the great number of surgical and functional failures that much more must be written and greater study given by those who would undertake this class of surgery.

Men cannot be masters of this work with an ordinary training. It is a matter of many years of the most concentrated study if they expect to give the unfortunate one that to which he is entitled.

Cleft palate is the result of failure of union during development in embryo, of the parts which make up the palate. At the time of birth, a cleft palate child possesses the normal amount of tissue (with rare exceptions), to form a perfect palate, although it is not united; statements to the contrary notwithstanding.

It is true, however, that later in life, due to insufficient use of the musculature of the palate, more or less atrophy results. It is likewise true that any other part of the body when not used does not develop.

This one truth alone should be sufficient to commend early surgical intervention upon the bones as well as comparatively early surgical

Case 1. Plate 1. Boy five years old. Showing cleft of bones. A cleft of this character should be operated at the age of from three to six weeks. Attempts had been made to close this palate before I was consulted. In cases of this character it is either necessary to employ a Greenstick fracture technic or long slow movement of the jaws into position.

treatment of the soft palate as advised by Brophy.

EMBRYOLOGY AND HYSTOLOGY

In the formation of the palate there are six centers of ossification, two palatal, two maxillary, and two pre-maxillary; and associated with the bone centers are the soft tissues, mucous membrane, connective tissue, periosteum, et cetera, which go together to form a normal palate. Only when an interference of some character occurs, do we have cleft palate result, often associated with cleft of the lip.

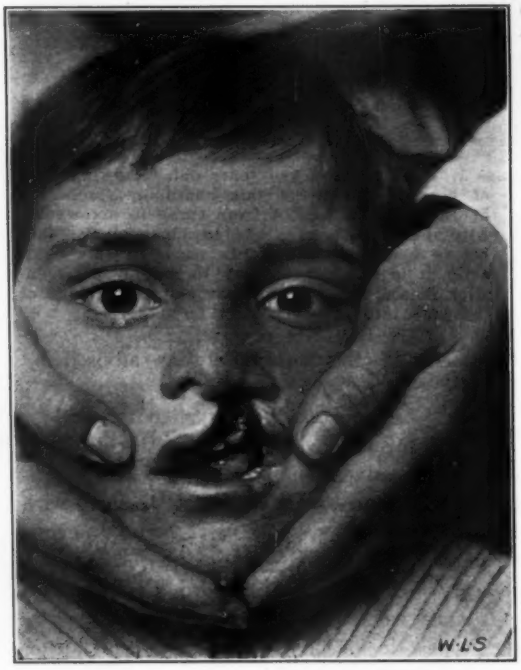
During embryological processes all babes have cleft palate prior to the second month of gestation. Near the end of the eighth or ninth week of the embryo, the palatal processes should be perfectly united.

PREDISPOSING CAUSES

There has been much written relative to the etiology of the cleft palate; yet, most may be, and doubtless is, conjectural. This deformity, like

*Read before the Southern Minnesota State Medical Association, Mankato, November, 1920.

all other teratological phenomena, is subject to further investigation. Different authors have attributed as causes, prenatal impressions, uterine inflammation, venereal diseases, pressure, defective nutrition during early weeks of gestation, heredity, and intervening mucosa in tooth enamel formation. The one standing out most convincingly is heredity. Prenatal impressions have been suggested by some writers as an etiological factor. They may be a factor causing failure of union. However, there has been no evidence of value given * * * No doubt faulty metabolism may play an important role in certain few instances. However, it is my belief that the child may be generally a weakling and yet be normal as to formation of parts. It has been stated by Professor Warnekros that super-



Case 1. Plate 2. Shows condition after employment of Greenstick fracture to close cleft, and the bringing of the nose into the median line of the face.

numerary teeth are always the cause. The late Doctor C. F. W. Boedecker, attributes the cause to intervening mucosa in tooth formation. The mucosa, during formation of the teeth, dips deep down into the submucous tissue and forms the epithelial lamina, this later contracts into the epithelial cord at the distal end of which the enamel organ is formed, thus forming an obstruction.

Brophy says, "It seems that Boedecker's con-

Case 1. Plate 3. Shows child after correction of the lip.

clusion that this epithelial cord delays union of the parts forming the maxillae, and the force exerted by the tongue and mandible from the beginning of the third month until birth and several months later, would account for the broad separation of the maxillary bones and the creation of the cleft."

Uterine inflammation and venereal disease no doubt are the cause of many physical defects. Inflammation may affect the development as it does many other parts of the body.

Doctor Charles Mayo believes and has said, "There is a great principle involved in the causation of birth deformities, and it is one which should explain various types of deformities. As one observes birth defects or anomolies, it is apparent that many of them are normal conditions in some lower type of life, e. g., harelip, cleft palate, fissure defects, etc. Anomolies in circulation, multiple ureters, location of organs,

Case 2. Plate 1. Case similar to Case 1, Plate 1, only more advanced in years. Boy aged 11 years.

and defects due to changes in the evolution of the invertebrate to the vertebrate, which largely affect the nervous system, acephalus, hydrocephalus, spina bifida, club foot and post-anal dermoids.

Experimentally, changes in the salts in which the eggs of several of the lower forms of life are developed, lead to a certain percentage of anomolies. This is undoubtedly the reason why a high type of fish like the salmon, probably in an evolutionary state, leaves salt water to lay eggs in fresh water. Anomolies in the human embryo occur in variation of fluid, especially excessive quantity of hydramnion. It is most probable that the cause of embryonic deformities is due to changes in the salts of the amniotic fluid in which the egg is developed, just as it has been proved to be in the lower types of life."

Observations made by Doctor O. A. Strauss in the study of abnormalities of animals in the zoological gardens at Berlin, October 1913 are particularly interesting. Thirty-two jaguars born of one mother by the same sire, within one year, had cleft palate and all died. The parent animals were fed cold meat from which the blood had been allowed to escape. Later the diet was changed and they were fed meat which was still warm, and which contained blood, and upon this diet not a single cleft palate occurred out of two litters in one year (about twenty-five jaguars).*

* * Brophy's Surgery—Pages 579-80.

On the other hand, Mall's investigation on the collection of monsters at John Hopkins is at least suggestive that the primary factor is located in the embryo.

It has been my experience when possible to obtain a good history of a family that almost always a record of cleft palate was noted. On the other hand, parents are reluctant to give their true history, so it is often difficult to trace heredity.

As a general thing, nature does not fail to pro-

Case 2. Plate 2. Shows cleft of the hard and soft palate closed.

vide sufficient tissue to form a normal child with a normal palate, but often fails to bring the parts in apposition so union will result. We are consequently dealing with a true arrest of development. We are therefore inclined to conclude that whether from inflammation of the female pelvic adnexa, or from a more subtle cause, the early nutrition of the embryo is in-

Case 2. Plate 3. Nose in middle of face and lip corrected. Case of this character should be taken care of early as described in paper, thus avoiding the necessity of heroic measures.

terfered with, thus producing a dis-harmony of the growth energies.

EXCITING CAUSES

The tongue is thicker between the second and third months of intrauterine life than it is at birth, and consequently, takes up more space between the developing bony plates of the palate, thus interfering with their meeting and union. The muscles of mastication becoming active about the third month, bring pressure from the mandible on the flexible bones of the palate, serving as a wedge, forcing the halves apart, resulting in a much wider breach.

Normally, the upper jaw, from tuberosity to tuberosity, is smaller than the lower. If careful observations are made of a child with complete cleft of the hard and soft palate, it will be found that the upper jaw overlaps the lower. This makes it easy to see how the mandible may spread the two halves of the upper arch.

The normal position of the fetus in utero, is such that a great part of the body weight may be thrown upon the vertex, and the pressure exerted tend to force the mandible into contact

Case 3. Plate 1. Condition of lip after operation in early infancy.

with the sternal region and compress it against the forming hard palate. The head being in a flexed position, with the symphisis of the mandible resting on the sternum, may add to the force exerted by the mandible.

PHYSIOLOGY

Deglutition is most difficult for a child with cleft palate, and, as a result, many are poorly nourished. The milk taken, in the act of swallowing, regurgitates through the nose.

Both the palate and the tongue are important organs of speech, but the former is the more so; for , not only is it essential in the enunciation of nearly all the elements of speech, but owing to

Case 3. Plate 2. Note wide spread of the nostril.

its direct attachment to the larynx, it is also an important factor in the production of the voice. It is in the articulation of consonant sounds that the palate is especially essential.

SPEECH HABITS

It must be remembered that the acquirement of speech habits begins early in the second year and continues during the period of childhood. It is during this time that nature provides for the normal development of speech. Children appear to inherit a tendency toward speech development and cases have been reported in which whole sentences have been uttered spontaneously without any preliminary practice. The more serious forms of defects of speech are those that are acquired during this formative period. It is then that faulty impressions of the elements of speech are stored in the auditory centers of the brain and faulty habits formed in the use of the various mechanisms of speech.

Case 3. Plate 3. Note change of nostril. Roll of the vermillion border of the lip established.

Time does not permit me to here cover the full physiological function of the palate, yet in defense of the early operations a few facts must be considered.

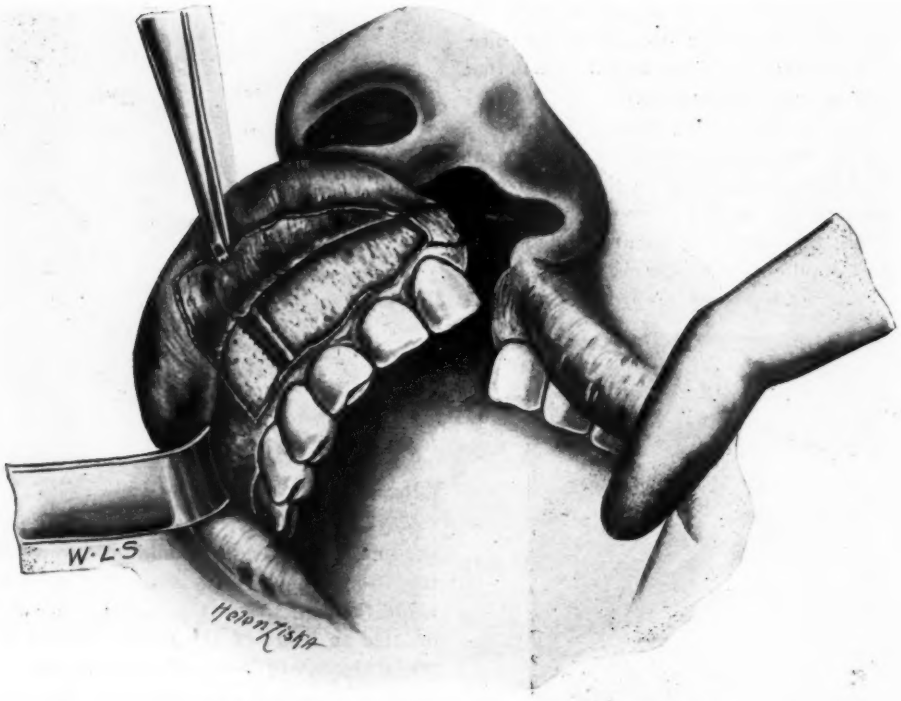
Inasmuch as surgical measures for the closure of the cleft palate are undertaken largely for the purpose of improving speech, they should be employed as early as possible before the formative speech period.

Habits of speech formed early cannot be changed without special instruction. To make a normal palate take the place of a cleft palate, the soft parts must be so manipulated as to avoid the formation of scar tissue. If incisions are made through the soft parts and measures are omitted to lengthen the palate, masses of cicatricial tissue will form with contractions.

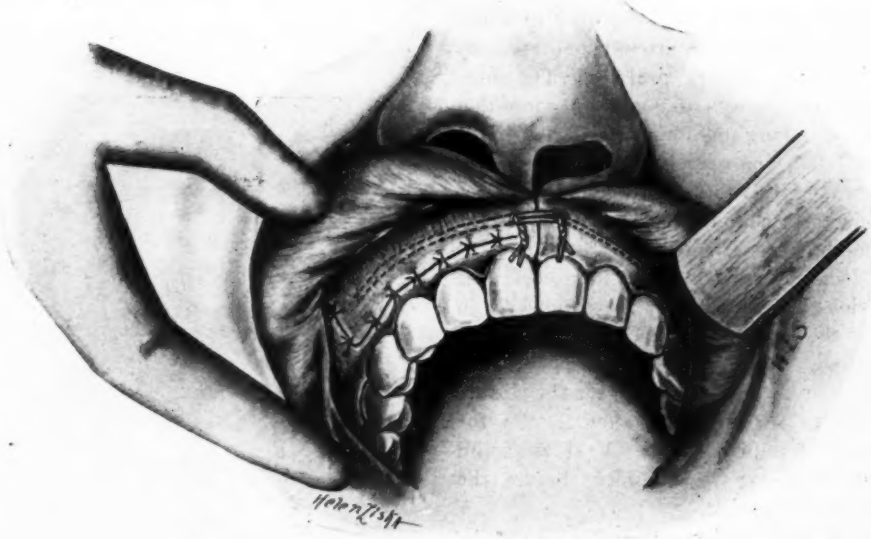
Case 3. Plate 4. Correction of lip. Change of shape of nose.

When a cleft of the palate is improperly operated the patient's faulty speech affects him both mentally and physically. It has been said that a faulty habit of speech must be supplanted by a correct one, but it becomes more than a habit with these cases. It is a deeply rooted neuro-muscular disturbance or perversion that has arisen from an effort on the part of nature to accommodate it-

Case 3. Plate 5. After one year. Note change in expression.



Case 4. Plate 1. Diagramatic of modification of Brophy greenstick fracture operation.



Case 4. Plate 2. Illustrates wires in the muco-periosteum, flaps brought back and sutured with horse hair.

Case 5. Plate 1. Very extensive single cleft of the hard and soft palate.

Case 5. Plate 3. View inside the mouth, showing the bones placed in proper position.

self to developmental structural irregularities in certain important parts of these mechanisms It is somewhat analogous to the effort on the part of the neuro-muscular mechanisms of the heart to accommodate themselves to a faulty valve, but it is far more complicated because of the volitional and other physical faculties employed in the development of speech.

Dr. Brophy has designed a nipple which enables the babe to take its food with little difficulty and it is surprising how quickly it recognizes this and will poke its nose around in search for the nipple before beginning to nurse from the mother. He has also designed another nipple for the bottle babe, made on the same principle.

FORMS OF CLEFT PALATE

The different forms of cleft palate will not be presented in this paper, other than to state that there are, in number, fifteen, and that the form decidedly governs the time of operation, et cetera.

PREOPERATIVE TREATMENT

I have been convinced many times that the value of feeding an infant preparatory to surgical intervention has been sadly overlooked. *Failure to secure proper nourishment is a valid*

Case 5. Plate 2. External appearance after the closure of the bones only.

Case 5. Plate 4. Case completed. Slight correction of the vermillion border was made later.

Case 6. Plate 1. Before surgical intervention.

Case 6. Plate 3. Case completed.

reason for early operation. The general condition of the babe should be considered carefully. Too often these children are brought to the hospital and subjected to operation at once. In a couple of days a cold develops which may have been contracted on its way there, and its affects, added to those of the anesthetic and operation, may result in pneumonia and death. Accordingly, it is my judgment that the services of a pediatrician should always be employed.

OPERATIVE TREATMENT

It must be ever borne in mind that the palate is one of the most important organs of speech and being directly attached to the larynx, makes it a most valuable factor in voice production. The articulation of consonant sounds is very difficult for cleft palate children. I recall one young lady, twenty-seven years of age, for whom I operated an extensive cleft palate, who had much difficulty in learning to talk. I kept in correspondence with her for two years, directing her in learning to speak over again. Great patience should be manifested for those so afflicted as they have more trouble than we are able to appreciate, and are most always too timid to seek our cooperation. We must remember that the closure of the palate is not the only thing sought

Case 6. Plate 2. After bone surgery only.

Case 7. Plate 1. Unhappy result after operation in childhood. Note the broad, flat nostrils.

Case 7. Plate 2. Nostrils narrowed fully one-half inch. Lip corrected.

Case 8. Plate 2. After lip correction. Twin died few months after returning home.

for. The most important by far, is presenting to the patient a flexible, resilient, palate which is so much needed in speech.

A babe with complete cleft palate and either single or double harelip should be treated in three steps as follows:

1. Bone surgery, if possible, within the first month to six weeks.

2. Lip and nostril, six weeks after the bone operation, or earlier, if the bone operation has been a success and the splints removed.

3. Soft palate, preferably about the fourteenth to sixteenth month.

The bone surgery should be done early before ossification has advanced, the bones being more easily moved to the position desired and the shock being much less to the patient.

When there is a double cleft with premaxillary protrusion, *this premaxillary bone must never be excised.* A deformity follows which is far greater and more difficult to repair than that originally presented. It is in fact, a calamity that cannot be repaired. With the excision of the premaxillary bones go the tooth germs and

Case 8. Plate 1. Twin girls. Each twin possessed complete cleft of the soft palate and single harelip. The anterior ridge of the hard palate was not involved in either case.

Case 9. Plate 1. Double harelip.

Case 9. Plate 2. After operation.

Case 10. Plate 1. Side view of a very extensive double cleft of the hard and soft palate with premaxillary protrusion.

the child is forever missing temporary as well as permanent teeth. *They must be put back into position to form a normal arch.*

Operations performed in early infancy afford the best results, despite the fact that very successful operations may be made at almost any time in life.

It cannot be too frequently repeated that the first undertaking should be the closure of the cleft of the bones, because herein lies the success of the subsequent operations. With proper technic following, the normal physiological functions of the palate are restored.

The many complications encountered in this field try the ingenuity and patience of the surgeon to the very utmost.

Certain definite steps must be carried out to give the child a flexible resilient palate. A specially designed periosteal elevator should be used to perfectly separate the soft tissues from its periosteal attachment. Great care is necessary in the very initial step of passing through

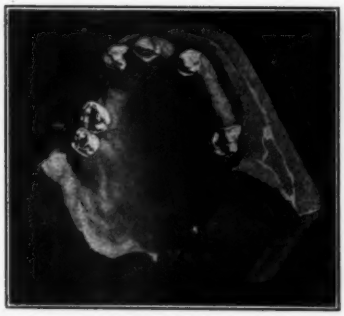
Case 9. Plate 3. At age of eleven years.

Case 10. Plate 2. Front view of the same case.

Case 10. Plate 3. First operation. Placing the premaxillary bones into position to form a normal arch.

Case 10. Plate 4. After correction of lip.

Case 11. Plate 1. Cleft of the soft and part of the hard palate in woman aged forty-four years.



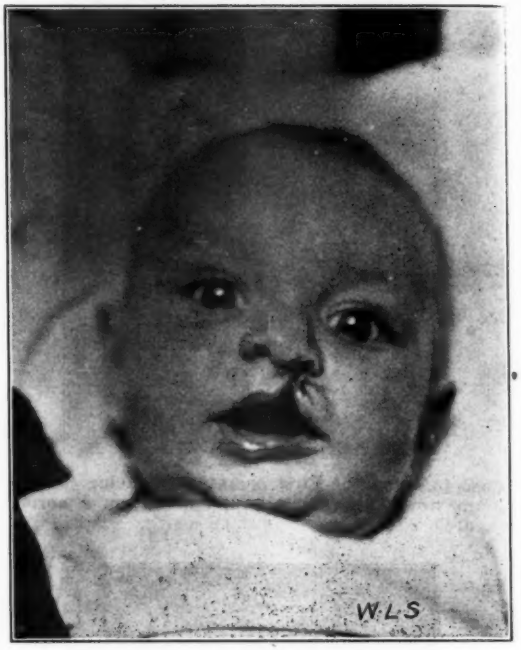
Case 11. Plate 2. After closure of the complete cleft in one operation, without the employment of lateral incisions.

Case 11. Plate 3. Photograph of patient.

Case 12. Plate 1. Nipple designed by Brophy to aid child when nursing from the breast.

Case 13. Plate 1. Nipple designed by Prophy to aid child when nursing from the bottle.

Case 14. Plate 1. Cleft of the anterior ridge of the hard palate involving the soft palate, lip and nostril.



Case 14. Plate 2. After bone operation only. Note how the two halves of the lip fall into position when bones are properly placed.

Case 14. Plate 3. After lip and nostril have been repaired. Note position of the nose in the median line of the face.

the muscular mucosa, down to the periosteum in the process of lifting the soft tissue.

The periosteum should be freed along the posterior border of the horizontal plates of the palate bones, extending down and back of the hamular process on either side. Very rarely is this accomplished in cleft palate surgery.

When the horsehair coaptation sutures are placed, no tension can be allowed, or sloughing will follow, and the operation result in failure. It is necessary, at this time, to place tension sutures of silver wires supported by lead plates, to prevent tension on the horsehair sutures, as described above.

POST-OPERATIVE CARE

In this operation, post-operative care is most essential. Isolation of bacteria being impossible, it is necessary to irrigate the parts after each feeding, and in some cases, a half dozen times a day. When it is impossible to isolate an organism, it must be combatted by other means, and in this instance, constant irrigation is considered one of the laws of success.

In the last two operations, namely, that on the lip and that on the soft palate, great care should

be exercised not to traumatize the tissue more than is necessary, as sloughing, particularly in the soft palate is apt to follow.

Lateral incisions in the soft palate should never be made (they are unnecessary) because in so doing the tensor palati muscle and nerve are very likely to be severed, and once severed do not reunite. Following in the wake of this unfortunate procedure is deafness, owing to the fact that by traction in the act of swallowing and speaking, the tensor palati muscle dilates the pharyngeal orifice of the eustachian tube.

Permanent sutures left in the mouth at the completion of any of these operations should be silver wire, lead plates and horsehair, for the reason that they do not absorb the saliva which is constantly contaminated with different forms of bacterial life.

Older cases are not complete until speech training has been initiated.

Discussion appears on page 289.

AN ATTEMPT TO UNIFY AND HARMONIZE POINTS OF VIEW OF MEDICAL AND DENTAL PROFESSIONS TOWARD THE CONSTITUTIONAL INFLUENCE OF DENTAL PATHOLOGY*

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E. L. TUOHY, B. A. M. D.
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The title of this paper and collaboration of a dentist and a doctor will draw to your attention our desire to point the need of a more rational cooperation between the two professions than is presently obtaining. The report aims to be a presentation of the viewpoints of both professions, not as distinct entities but as a common judgment. Since the subject of arthritis has received the largest amount of attention from the standpoint of focal mouth infection, we are fortunate in being able to present the data on 397 cases studied in the army from the dental point of view by Dr. Mentzer under the service of Dr. Ralph Pemberton and others. His work on gum prophylactic treatment of diabetics under F. M. Allen will be referred to. In addition, I (Tuohy) have gone over all the records of the Duluth Clinic for the past three years, of cases diagnosed as arthritis. The data on these will also be presented. We will purposely give attention primarily to the teeth and gums. This is because tooth extraction to dissipate constitutional disturbances based on a supposed alveolar infection has gone so far as to be almost alarming. Reference will be made to the question of tonsil infection chiefly as a matter of comparison.

*Read before the Minnesota State Medical Association, St. Paul, October, 1920.

THEORETICAL CONSIDERATIONS OF FOCAL INFECTION.

Billings, Rosenow and their followers may well be congratulated on the rapidity with which their early teachings have secured popular approval. Approval based on clinical results has, as a whole, been more evident than experimental confirmation by other observers. It is not our intention in this paper to discuss the question of transmutability of strains of streptococci or the question of regional or tissue selectivity for certain orders of streptococci or their toxins—normal or abnormal denizens of the mouth. This feature has received so much attention that no reference to any human disorder has seemed complete or judicious without a reference to the probable effect of alveolar infection and the need of its eradication. It recalls the trail of many previous medical hegiras into the field of speculation, searching for a ready panacea for human ills. Nevertheless, we wish it to be distinctly understood that we think the focal infection principle gave to the profession a very positive weapon for human defense; it is encumbent upon us to learn how and where to apply it within safe limits. A growing number of individual experiences are at hand in the work of every busy clinician, clearly establishing a reasonable basis for such a search for alveolar pathology with resultant improvement after its eradication. In fact, it is the result of our enthusiastic approval of the principle of focal infection that has induced us as physicians to go too far in encouraging tooth extraction. The fear of tooth infection following operative dentistry, as well as the unexampled claims made for benefit from wholesale extraction of teeth, has stifled the enthusiasm of conscientious dentists for conservative dental reconstruction; or, it has driven them pell-mell into the schools for exodontists.

No other surgical focus of infection has re-

ceived even a small fraction of the attention given to the teeth, with the possible exception of the tonsil. A comparison of these two foci is particularly instructive: A tonsillectomy properly done results in little physiological change or rarely much discomfort to the patient, barring a possible dry throat. This statement relative to the fruitless removal of the teeth certainly cannot be made. Bodily nutrition stands out as one of the most fundamental problems of life. Many of the lower animals are helpless without their teeth. It has been stated repeatedly that the teeth are transitory organs developed from highly specialized ectoderm; that under ordinary tendencies they show early evidence of deterioration. Prior to this crusade along the line of alveolar infection, American dentists had acquired a world wide fame for conservatism and skill in tooth reconstruction and in the maintenance of a proper chewing surface. We will all grant that they undoubtedly went too far and retained many teeth by pegs, bridges or other means that should have been extracted. They were also, no doubt, careless as to asepsis. Nevertheless, it has been proven that entirely safe and reasonable dental work can be done at a time when teeth can be saved. Therefore, the dental profession needs our aid in teaching people who present themselves sufficiently early the proper conservation of their teeth and gums. Teeth are not only ornamental but extremely useful, and no set of false teeth, however skillfully made or fitted, can repace a reasonably serviceable and intact original group. Especial emphasis is given this because it is not the dentist who has shown the greatest desire to remove the teeth. Great impetus has been given this tendency by the lazy attitude on the part of the clinician, who sees a shortcut to results rather than the time honored search through the arduous methods of differential diagnosis, for a logical treatment.

A REFERENCE TO THE DENTAL LITERATURE

Doctors do not read the dental journals enough; they should become more familiar with the valuable research being conducted by the dentists themselves. They should become acquainted with such names as Talbot, Schuhmann, Federspiel, Hartzell, Price and others. Percy R. Howe, of Boston, Mass., in recent numbers of the National Dental Association's Journal, has ideas on focal infection that every doctor should read, whether he agrees with him or not. Rosenow intimates that Howe's experience has been too largely attained in a dental infirmary for children. His point is well taken, but Howe's criticism of animal experimentations in general, is in keeping with the findings of Rufus of New York, that egg albumin injected into the ear vein of a rabbit produced much the same result as when the various strains of streptococci were used.

Howe takes particular exception to the method of injecting very large masses of culture material into this most susceptible laboratory animal, and thereafter quoting the resultant gross changes in certain organs as being suggestive of what happens to a patient who happens to show a few apical granulomata.

THE SHIFTING SANDS UPON WHICH OUR PRESENT KNOWLEDGE OF IMMUNITY IS BASED

It would seem judicious, in view of the numerous mooted questions involved in our protection against disease, to speak of immunity very guardedly and weave it into any argument with due reference to its numerous conflictions. This is not done by most of the strong proponents of focal infection. Our immunity to acute and chronic infections must be a very subtle question of balance between the bacterial invader and the host. Probably, as Price has vividly portrayed, while life exists there is this battle waging back and forth, with varying success, either to host or invader. A certain turning of the tide in the favor of the host may be brought about by clearing up mouth infection and instituting proper hygiene; but, to reason that if improvement does occur the true etiologic factor has been uncovered, is a therapeutic fallacy needing no refutation. Our population includes a very large percentage of substandard individuals,—those with an emotional capacity far out of proportion to their physical reserve. It is in this class that the enthusiast can most skillfully exercise the imagination.

He does not pause at the demonstrable effect that may be produced on joint surfaces or valve leaflets by streptococci or their toxins, said to attain the circulation from a circumscribed apical abscess, but feelingly refers to those influences producing violent functional changes through that elusive phantom the endocrine balance or vasomotor control. The problem is not

as simple or direct as we might wish: the pediatrist has noted that in the presence of an acute tonsillitis, children are particularly susceptible to pyelitis. The invading organism in the tonsil is usually the streptococcus; when the pyelitis develops it is usually of the colon bacillus type. Removal of the infected tonsils appears clinically to have turned the tide in favor of the child and hastened a remission in the pyelitis. Ivy's experiments on the artificial production of gastric ulcer is illuminating; direct trauma or even direct bacterial injections into the wall of the stomach did not produce ulcer in healthy dogs; a distempered dog, however, readily developed experimental ulcer.

The balance of strength between invader and host has another tragic significance; the unwise removal of too many diseased teeth, or too much gum manipulation, has overwhelmed an already grievously afflicted individual too often to be considered a matter of coincidence. This we have seen in instances where we felt the mouth condition was entirely secondary to a systemic state or possibly the primary source. A man, a very severe drinker, with a foul mouth, got on fairly well after some preliminary cleaning up of pyorrhea alveolaris and the extraction of a few roots. His impatience led his dentist to more elaborate extraction, and a hematogenously implanted pleuropneumonia ensued, with an ultimate lung abscess and prolonged and horrible death. Less vivid, but equally direct, is the experience of numerous pernicious anemias, diabetics, and that wandering flood of chronic arthritics, who, grasping eagerly at any straw, arise toothless but hopeful. The natural remissions of the disease are credited as good results following tooth removal. Cause and effect are being constantly interchanged. Time, and a close tabulation of cases, will of course tell us the truth, but in the meantime we must hasten, before the adult population becomes toothless. Laboratory research alone will not settle the question. The practical doctor and dentist must work hand in hand, and both use their very best judgment. It is not sportsmanlike to leave the matter of tooth extraction to the judgment of the patient with a chronic disease; his judgment is neither good nor scientific.

PRACTICAL CONSIDERATIONS

We must admit that things are not going entirely well with this matter of alveolar infection. The dental and medical professions are crystallizing into points of view decidedly antagonistic.

You hear on the one hand that nobody, however healthy, should be permitted to retain a dead tooth, and that any evidence of a tooth abscess should be the basis of immediate extraction.

At the opposite extreme stands an equally firm and apparently logical group who hold that so-called apical granulomata may be meaningless and represent harmless efforts at localization following upon irritation, not alone bacterial but possibly toxic chemical or mechanical.

Between the two extremes stand the greatest number of careful clinicians, who are convinced that under certain conditions clinical experience has shown decided improvement following upon the eradication of definite gingivitis, pyorrhea, or the removal of inflammatory foci about the root ends.

Not many statistical reports, however, are at hand. Bryce, of Memphis, Tenn., reported at the last meeting of the A. M. A. at New Orleans, a study of 100 cases that had been relieved of surgical foci of infection in the mouth. The discussion of his paper* by Drs. Billings, Pratt, Thayer, Solomon, and others, is particularly notable in sensing the time, and is in keeping with the caution relative to the interpretation of surgical foci in the mouth that is rapidly becoming universal. Bryce's report as to arthritis is a very limited one. His suggestions relative to a few conditions such as hypertensive states, general neurotic conditions and achylia gastrica, indicate that he also is confusing cause and effect.

DATA PERTAINING TO ARTHRITIS

Time will permit only the briefest reference to the work of Dr. Mantzer done in U. S. Army Hospital No. 9 at Lakewood, N. J., in association with Dr. Ralph Pemberton and others.** This study was made on 397 case of arthritis coming under their observation. For the details, the reader is referred to the original article, which is in some detail. Under various headings Pemberton suggests that it is the experience gained from the results of individual cases of arthritis following the eradication of surgical foci of infection that has given this mode of attack its

*Journal of the A. M. A., Vol. 74, No. 24, June 12, 1920.
**Archives of Internal Medicine. March, 1920. Vol. XXV, Pp. 231-282; April, 1920, Vol. XXB, Pp. 335-404.

prestige, rather than the sum total of experience that one arrives at by a study of cases in groups. I quote directly from Dr. Pemberton's report:

> "Although the etiologic importance of focal infection, especially in civil life, is not to be minimized, it is clear that the present group showed a considerable independence of it. One hundred and eighty-four patients, or 46 per cent, recovered in the presence of demonstrable surgical foci. This is nearly three times the number which improved (65 cases or 16.25 per cent) after the removal of foci. The tonsils were most frequently the site of infection, 52 per cent; the teeth were next, 33.5 per cent; the genito-urinary tract came last, 12 1-2 per cent, and clearly played an almost negligible role in causing arthritis."

The following results and table give briefly the findings in these "arthritis" cases from the dental point of view. Quoting verbatim: "Any condition about the mouth from which absorption might take place was considered a possible focus. Caries was divided into three classes, respectively, slight, medium and heavy, to assist the dental department in giving attention first to the most needy cases. Under 'caries slight,' are classed the cases in which the enamel was etched or just broken; under 'caries medium,' are classed the cases in which the decay had proceeded farther, but not far enough to endanger the pulp, and under 'caries heavy,' are classed the cases in which the pulp was endangered or already exposed.

"Conditions falling under the classifications 'simple gingivitis,' and 'condition of the gums, fair or poor,' were not regarded as foci, but were considered as paving the way for infection and suppuration, and were corrected immediately to prevent the deeper tissues from becoming involved. The number of cases falling under 'gingivitis, simple,' and 'condition of gums poor.' was large owing to the fact that these patients were not able to give their mouths the average amount of care. This is illustrated by the number of subjects showing salivary deposits. Under 'pockets' about the necks of teeth have been listed all cases where such conditions were found, whether suppurative or nonsuppurative. Very few of these cases were suppurative, the larger number being caused by calculus deposits, or the impaction of food between the teeth had not progressed to that degree. When ulcerative gingivitis was present, or when there were pockets about the necks of the teeth, it became necessary for the examiner to determine whether in *his* opinion the condition present constituted a focus or not.

"Under abscessed teeth come the various alveolar abscesses, acute, chornic (with, and without sinus) and blind abscesses, all of which were classed as constituting foci. The Roentgen rays were resorted to when there were deep pockets about the necks of the teeth and in all cases in which there was the least possibility of an apical abscess. An analysis of 397 cases revealed the following conditions in the proportions indicated:

Caries, slight, 118; not constituting a focus.
Caries, medium, 80; not constituting a focus.
Caries, heavy, 79; not constituting a focus.
Calculus, subgingival, 211; not constituting a focus.
Calculus, salivary, 116; not constituting a focus.
Condition of gums, good, 164; not constituting a focus.
Condition of gums, fair, 103; not constituting a focus.
Condition of gums, poor, 112; not constituting a focus.
Gingivitis, simple, 216; not constituting a focus.
Gingivitis, ulcerative, 25, constituting a possible focus.
Pockets about necks of teeth, 77, constituting possible foci.
Abscessed teeth, 126, constituting foci of infection.
Incidence of abscessed teeth among all cases examined, 30 per cent.

"Only nine cases which did not have an abscess but showed either pockets about the necks of the teeth or ulcerative gingivitis, or both, were considered actual foci of infection, making a total of 135 instances or 34 per cent."

A study of the records of 105 cases diagnosed under the main heading of "arthritis," in the Duluth Clinic, covering the period of the last three years, by one of us (Tuohy), leads to very much the same conclusions. These figures, coming entirely from civil life, curiously approximate in a fair degree those of Dr. Pemberton representing young army recruits.

Of the 105 case records studied, 90 were diagnosed primarily as some form of arthritis; the remaining 15 had some other definite complication, such as diabetes, chronic nephritis or ar-

terial degeneration. (No attempt is made at this time to further classify the arthritis group into its subdivisions, except that of the uncomplicated, 51 are classed as acute and 39 chronic). The records were not all complete as to notations on teeth and tonsils and the genito-urinary tract, which was the particular object of this quest. However, considerable information was found available.

Table 1 will show a division of cases into acute and chronic, and the number of each showing tonsil or tooth infection, with the results following eradication of these foci. Of course other treatment was provided for these patients in addition. Some were not under observation very long after the foci were removed, and in the interpretation of results the individual view point of the observer could occasionally be suspected.

TABLE I.

Cases of Arthritis From Duluth Clinic Studied From Standpoint of Foci of Infection in Tonsils and Teeth.

July 1917 to July 1920.

Total number of cases	105
Classified primarily as arthritis	90
With serious associated conditions	15
Uncomplicated cases classified as acute	51
Uncomplicated cases classified as chronic	39

	Acute group	Chronic group
Number showing tonsil infection	32 or 62%	13 or 33%
Number showing tooth infection	17 or 33%	24 or 60%
Improvement following tonsillectomy, 31 cases	21 or 68%	8 or 61%
No improvement after tonsillectomy	10 or 32%	5 or 39%
Improvement following eradication of teeth foci (17 cases)	8 or 47%	8 or 33%
Negative results or made worse	9 or 53%	16 or 67%

Two cases each in the chronic and acute groups were diagnosed as genito-urinary arthritis.

Two deaths occurring in the chronic arthritis group (one complicated and the other uncomplicated) are especially worthy of brief mention:

A. A. J., aged 33, came for examination May 4, 1920, with a very severe pain in the right chest and a condition which simulated asthma. He later developed polyarthritis and severe abdominal pain, probably muscular in origin, because he later developed muscular pain elsewhere. A marked effusion occurred in the right knee. The temperature ranged not higher than 101 degrees. He became anemic, with a cell count of about 3,000,000, and showed a leukopenia (4,400). Conservative measures resulted in considerable improvement, but the knee condition would relapse frequently. He left the hospital, however, after about a month, able to get about. Sometime in July, following the extraction of a few teeth elsewhere, he is said to have developed a slow, indolent mouth infection, suggesting a noma, from which he gradually succumbed.

The other man had a marked arteriosclerosis and a moderate hypertension (a separate and distinct entity), a "combination form of nephritis," and achylia gastrica. He was severely sick in any case, but teeth removal was probably injudiciously advised; he failed rapidly thereafter.

THE NEED OF DEFINING TERMS AND CIRCUMSCRIBING RESPONSIBILITY

Up to date, ideal methods of association of dentist and doctor have not been attained. The two professions attend their own meetings, read their own literature, and largely follow their own inclinations. This should not be. The dentist, when he becomes more than an operative reconstructionist becomes a specialist in medicine.

His problems then bear the same relation to the body processes as a whole as do those of the ear, nose and throat specialist or the dermatologist. It seems only logical, therefore, that the basic knowledge underlying the ultimate study of one medical specialty should be the same as of the other—some of the same hospital experience and attention to general pathology and physiology. If this point of view ever obtains, it is only fair to suggest that the field of the oral surgeon shall not be restricted rigidly to the teeth and gums, but include at least the mouth and accessory sinuses.

In drawing attention to definitions and pathological sequences, physicians should come to consider many tooth factors in addition to infection, a point they are prone to over-emphasize. A few

statements relative to the teeth and their implacements seem opportune:

The alveolar process is made up of cancellous bone tissue, transitory in character.

The peridental membrane fills the space between the tooth root and the surrounding bone, and covers the root beyond the crest of the alveolar process to the junction of the root and crown. Its purpose is to cushion the tooth against the stress of mastication and support the gingiva, causing the latter to hug tightly about the tooth. The gum portion just adjacent to the tooth is called the gingiva, and inflammatory reaction in this is known as gingivitis, which is usually classified as follows: (a) simple (b) interstitial (c) ulcerative (the latter may arise from specific sources, including Vincent's organisms.)

It is termed "simple" where only the liabial and lingual or buccal and lingual surfaces of the gingivae are attacked; if it proceeds to the interproximal gum tissue you have the "interstitial" form. Allowed to proceed further, it will advance in the direction of the long axis of the tooth, attacking the peridental membrane and producing a pericementitis, at first inflammatory but not suppurative. If allowed to become suppurative it is known as pyorrhea alveolaris. This inflammatory train of events is always passed through before the ultimate pyorrhea is reached. Naturally, the rapidity with which the different stages follow depends upon the severity of the irritant and the patient's resistance. When unchecked it becomes a progressive condition. Often fillings have sufficient overhang and crowns sufficient shoulders jutting into the interproximal spaces to be the initial seat of inflammation; but in such cases the gingivitis or suppurative pocket, if it has progressed that far, is generally localized to the area in question.

FACTORS INCLINED TO HASTEN THE GINGIVITIS TO PYORRHEA CHAIN

The factors that are best known may be summarized as follows:

(a) Tartar.

(b) Decay and defective dental work; improper crowns and bridges.

(c) Mechanical irritation of gingivae (such as would be produced by cross brushing of the teeth).

(d) Poor mouth hygiene; food lodgements.

(e) Metabolic reactions in constitutional diseases (these are legion and merit the closest study by physician and dentist).

(f) Faulty articulation. Bacteria or parasites are secondary invaders.

Time will not permit amplification in discussing these factors. A few will be touched on briefly.

Tartar is of two kinds, the result of salivary and serumal calculus. The first is a product deposited from the saliva, and in some mouths forms rapidly impinging upon the deep tissues, gradually destroying the peridental membrane, alveolar process and gum tissue. Usually the tissue adjacent to the root is destroyed, but without the formation of pockets. The serumal type is a black deposit on the neck of some teeth on the enamel. It causes a severe inflammation, with the destruction of the peridental membrane, and pockets result. The bulk of the tooth is composed of dentine, the root portion of which is covered with cement substance, and the crown portion of the tooth is enamel.

THE MUCH DISCUSSED DENTAL ABSCESSES

Talbot of Chicago has defined and classified four general types of dental abscesses:

(a) Alveolar (connected with sinuses in the teeth)
(b) Peridental or metastatic
(c) Alveolar
(d) Pulp abscesses

The peridental are located in the peridental membrane or fibrous tissue, originally alveolar process or in the dental pulp, and are due to infection from without the roots or other sinuses of the teeth.

An analysis of (a) and (b) brings up the question concerning the influence on the general health of gingivitis or pyorrhea alveolaris. No one can doubt that there is an area large in extent, capable of infecting adjacent tissues, including the tonsils, the sinuses, and under certain conditions the alimentary tract, and one of the common sources of the peridental or metastic abscess ("B"). Despite the imputation that pyorrhea is well drained, clinical evidence strongly supports the contention that it does constitute a decided potential focus of infection.

The abscess tooth group "c" and "d" represent a feature that has been given the greatest attention and concerning which there are still many mooted points. The X-ray film deserves great credit for bringing these apical granulo-

mata to your attention, but it is also responsible for subordinating other conditions even more important. It is in the interpretation of these so-called root abscesses that so many patients have lost their teeth, frequently at the advice of their physician. It should be firmly insisted that the interpretation of the X-ray film and the decision for extraction should be left in the hands of the competent dental diagnostician, the closest attention being given to the clinical factors obtaining about the tooth or the area in question. The films themselves should be viewed from the standpoint of three groups:

(a) Slight areas of radio-lucency which may be present without infection at all, and due, as Talbot claims to have proven, to chronic irritation (chemical, due to gas or foreign material).

(b) The well defined area definitely walled off at the apex of the root, commonly termed granuloma; a circumscribed sac or mass of cicatricial tissue.

(c) Definitely spreading invasive infection, showing only slight areas of radio-lucency, less well walled off (the more active type of infection and a more dangerous one).

Regarding the first, let us quote directly from Talbot:

> "A closer study with the microscope of the pathologic changes that take place in the tissue, including simple irritation (stimulation), bone absorption and infection, inflammation and abscesses, will show us that a large percentage of so-called abscesses are not abscesses, but simply denuded tissue, with or without absorption or caries of bone." Quoting still further, "All pathology is not the result of infection."

We are able to show X-ray films which came to hand recently. They prove two things:

(1) The value of clinical consideration of the teeth.

(2) That all dark areas are not abscesses, the result of infection. These teeth were ordered X-rayed by a physician because they were crowned, and extracted by the dentist because they had dark areas at the apex. After extraction they were found to contain normal vital pulp, and the patient had lost two valuable molars.

In consideration of the second group, "b," the well defined area which is walled off, the published evidence concerning these is very contradictory. Theoretically, the fact that they are cicatricial tissue, have new vessel formation, and are composed of granulation tissue, indicates repair and an effort of nature to wall them off and restrict their limits.

In consideration of the third group, "c" the definitely spreading invasive infection: This sort of area should certainly be cleaned up, whether it has a casual relationship to systemic states or is the result thereof. In either case, its activity is unquestioned. In these cases the Roentgen evidence is less obtrusive and may be overlooked.

SOME OF THE STRIKING CAUSES OF FAILURE

With these considerations we may briefly attempt to analzye why "pot shot" attention to the teeth and gums is not yielding us the results we expected:

(1) The physician and dentist have not cooperated in the beginning to make a differential diagnosis, based upon which any form of treatment has a chance to succeed, i. e., in a very large number of people given dental treatment a better ordained diagnosis, according to standard methods and ideas, will make it apparent from the start that the teeth conditions, if a factor at all, are secondary to some primary constitutional disturbance. A patient consults a doctor and he forthwith X-rays his teeth and orders them removed; the dentist's role is a passive one. No good surgeon removes an appendix at some doctor's suggestion on such a basis.

(2) A fairly large amount of tooth extraction is done at the request of the patient, who asserts that to the best of his judgment his complaints are an exact counterpart of those encountered by some friend who got relief after the removal of abscessed or dead teeth. The exodontist takes the patient's word for it and no attempt is made to uncover the true disease. Later it is learned for example that the chest pains are not constitutional neuralgic manifestations of tooth conditions, but arise from a developing aortic aneurysm.

(3) After permanent pathologic changes are present (joints, fascia and tendons) a "cure" is expected by removing abscessed teeth or correcting faulty mouth conditions. It is too late.

(4) The physician, whether wittingly or not, usurps the province of the diagnostic dentist and intimates to the patient that such and such dentistry has been bad; that there is evidence of faulty technique in root fillings; that much of our dentistry has not been done under aseptic

conditions, and that such and such teeth should be removed. In this he fails to appreciate the vital features of a good dental appraisal of the mouth which should, in a very general way, be thus considered:

(a) The kind of individual care, as evidenced by general inspection;
(b) Status of mucous membrane and gingivae;
(c) The degree of gingivitis or pyorrhea alveolaris, if present. (Special attention to be given to the third molars, unerupted or erupted);
(d) Abscessed teeth.

"A" and "b" are most important in determining the future status of questionable teeth. If "c" is present it must be primarily considered from two points of view:

(1) Is it due to some irritant about the mouth, such as calculus, poor fitting crowns, bridges or faulty fillings? If so, it should be corrected, not from the point of removing a focus of infection but that such a condition, if neglected, is paving the way for widespread suppuration.
(2) Is it merely a secondary condition arising out of or from a general systemic state? This feature deserves fullest consideration, and is responsible for the next *primary* difficulty.

(5) Both dentist and physician fail to acquaint themselves with the common system states that influence the teeth. One of the most common of these that furnishes an excellent example is the influence of pregnancy. Severe anemias (primary and secondary), hypertensive states, nephritis, arterial degeneration, metallic poisons, environmental, dietetic, racial and climatic variations are mentioned only to suggest that original articles be consulted concerning them, and that a broader interest, (leading observing professional men to bring into the general literature the results of their studies) will aid greatly in the future. For the dentist's aid, the physician must lend a more attentive ear, because up to date the inquiries of the former have usually met the non-committal attitude of the latter.

The opportunity I (Mentzer) had in observing a large number of diabetic patients under the care of Dr. F. M. Allen, is timely and illustrative. The prevalence of gingivitis, as might be expected, was decided, particularly if a patient showed anemia; some had progressed to a severe pyorrhea. After these patients, under medical treatment, became "sugar free," it was possible by the ordinary prophylactic treatment, removing all irritants about the mouth, avoiding chemical, mechanical and surgical trauma, to promptly clear them up. But not until they became sugar free was this possible. Every case of severe pyorrhea alveolaris cleared up in the same way, and thereafter, if any minor oral surgery had to be done, healing was as prompt and satisfactory as in a normal individual. Diabetes is widely understood by both professions to play this important role relative to the gums, but your attention is respectfully called to influences just as real, though less outspoken, in the list of conditions mentioned above. Therefore, in attacking perverted metabolic conditions as typified in chronic nephritis, for example, we will find that much more can be done to rehabilitate the mouth after the tide has been turned more favorable toward the patient by the usual measures directed to relieve the load on the cardiovascular and renal mechanism.

As each patient is studied, the objective data is developed. A good part of these data is strictly impersonal. The interpretation, on the other hand, admits of the greatest personal variations particularly as to the plan to follow. The following statements are made, therefore, with the keen understanding that others may differ and that time and further study may effect changes. Nevertheless, we must have some standards of practice, and with that intent, these are offered:

GENERAL INDICATIONS FOR DENTAL PRACTICE

(1) In the presence of gingivitis, of whatever form, all irritants about the mouth should be immediately removed; the constitutional factors should be given the most careful study and corrected in so far as possible.

(2) The presence of pyorrhea should be corrected. Whether the teeth should be extracted or not will depend on:

(a) The extent to which the condition has progressed.
(b) The patient's systemic condition and the ability of physician and dentist to improve the constitutional state.

CARIES

"Simple" and "medium" caries (according to the definitions above given), should always be corrected by fillings or crowns. Correcting "heavy" caries necessitates removal of the pulp, and this I believe should be done only where

free access to the canal can be obtained and an X-ray shows the roots are straight or nearly so. Such safe root fillings are possible*

ABSCESS IN RELATION TO TEETH AND THEIR IMPLACEMENTS

If a tooth is definitely abscessed, particularly if it is evidencing local inflammatory symptoms, it should usually be extracted.

Regarding apical granulomata the burden of proof for extraction should be in favor of the tooth and not against it. Local treatments of straight root canals or root amputations are mechanically feasible and the results meet the indications.

I do not believe in extracting teeth simply because of apical granulomata and certainly not because of denuded areas at the apex or because the roots are not perfectly filled. If the condition is a borderline one and it is hard to determine in which class it belongs, certainly conservative attempts should be made to save the tooth, and in no case should it be extracted until other measures have been instituted, *and unless a keen differential diagnosis on the patient indicates that focal infection stands as a decided probability in the etiology of the systematic state under consideration.*

DEAD TEETH

A tooth should never be extracted simply because it is devitalized.

IMPACTED TEETH

These impacted teeth, particularly the third molars, are a great cause of reflex pain about the head and neck, and I firmly believe they should be removed.

IMPERFECT FILLINGS AND CROWNS

These should be corrected as well as full attention given unusual strain on any teeth the result of bridges or poor alignment or jaw deformity.

If the foregoing suggestions are followed I believe the wholesale extraction of teeth will be greatly lessened and a fair working basis for physician and dentist be established, that will be productive of the best results to the *largest number of patients.*

GENERAL CONCLUSIONS

(1) Doctors and dentists should have a literature more in common; they should come togethed in their meetings, and aim to present to the public an opinion common to both. Our suggestions from the dental point of view are already summarized under "General Indications for Dental Practice."

(2) The dentist should not be driven against his judgment to sacrificing teeth needlessly. We as doctors should not be too hasty in criticizing the dentist's handwork.

(3) We should aim to examine the patient and make an accurate diagnosis before experimenting with shortcuts to results that sacrifice the patient's dentition.

(4) The dentist must study more carefully the constitutional evidences of tooth and gum pathology, and the physician should painstakingly analyze those constitutional disturbances that are proven to have a clinical relationship with the teeth. The connection between tonsillar infection and these general states has been much more conclusively shown than has the relation with alveolar infection and similar conditions.

(5) We should not rely on the X-ray alone to make the necessary differentiations, any more than we do on the microscope or any other mechanical agent, in directing our therapeutics.

REMARKS BY DR. HARTZEL

Mr. President, Ladies and Gentlemen of the Minnesota State Medical Association:

I have had the opportunity of reading the paper by Doctors W. E. Mentzer and E. L. Tuohy of Duluth, Minnesota. I regard this paper as a constructive effort to induce the dental and medical professions to take a sane and moderate view of the pathogenic problems arising from mouth infection. Their attempt to unify and standardize our knowledge of the pathology of the mouth and its secondary effects is a distinct step in advance. There is no doubt that our present knowledge of the character of mouth infections and the result of their transplantation to other parts of the body has saved and will save many lives, as I am satisfied it is true that a great deal of endocarditis, myocarditis, and a considerable percentage of acute kidney infections as well as many chronic arthritides arise from this source. It is equally true that where this happens to be the whole and only source of an arthritis, nephritis, or a myocarditis, that a brilliant result has been obtained by the dentist, and

*Arthur D. Black, "Tabulation from 3,000 radiographic films of teeth and adjacent bone in mouths of 300 adults," supplement to address of chairman, Sec. on Stomatology, Am. Med. Assoc., N. Y. City, June 6, 1917: "Per cent of abscesses for all root fillings 47; for good root fillings 8; for poor root fillings 65."

the dentist on that account has been misled into thinking that the next case of the same character coming into his hands will yield as good a result as did the one he first treated, with a resultant swift remission of secondary symptoms.

Owing to the fact, however, that dental education does not require a broad foundation in human pathology and a wide knowledge in medicine, the dentist cannot and many times certainly does not know that oftentimes a case will present the same general symptom complex but owes its origin to some other cause or condition. Owing to his less broad training, the dentist fails to recognize this, and therefore falls into the error of promising the patient great gain, and owing to the fact that the etiological factor does not reside solely in the mouth, fails to produce through dental treatment the improved condition for which he hoped. Therefore, the effort of this paper to bring dentistry and medicine into closer cooperation, to stimulate the dentist to cooperate with the medical man at every point where he feels or knows his own power of judgment to be limited, cannot but result in great good to both professions and to the clientele we serve.

I certainly subscribe to the idea that the pulpless tooth is not a dead tooth. It has been shown conclusively that the dental pulp receives its nutriment through the apical foramen; cemento-blasts and cementum, and even the fibrillar ends of the odonto-blasts lying immediately between the cementum and dentine receive direct nutriment from the lymphatics which feed the peridental membrane. It is absolutely true that where pulps have been removed under proper aseptic precautions and the root canals hermetically sealed in those cases in which the peridental structures have not been injured, the teeth may live on and do good service for a life time. At the present time the speaker has three such dental servants in his own mouth. A life long observation of this problem as well as the personal experience in his own mouth with pulpless teeth has convinced the speaker that the crying need of dentistry at the present time is not so much the extraction of teeth as the conservation of them, and the adoption of aseptic surgery to dental pulps when such pulps must be removed. The dentist of the future will never devitalize a pulp except as an alternative to extraction. When the dental pulp becomes exposed to infection, the tooth should either have that pulp aseptically removed and the root canal hermetically sealed to prevent the ingress of infection or the tooth itself should be extracted. If the dentist feels he cannot save the tooth and prevent infection, then he should extract such tooth.

That it is possible to retain in one's mouth or in the mouths of patients pulpless teeth has been shown through at least fifty years of successful practise. On the contrary pulpless teeth, where correct efforts to shut off infection have not been practised, cause secondary disease in other parts of the body. The speaker has fortunately had a rather broad experiene in a study of arthritides brought about by mouth infections having studied between eight and nine hundred cases, but without the distinct effort to determine what proportion of these cases were due to dental infection.

It is my belief that there is unquestionably a considerable group in which dental and tonsil infection together are the joint source of this disturbance, and it should always be borne in mind that while dental and mouth infections are the most common sources of chronic arthritis that there may be other sources. Chronic intestinal stasis certainly does play an important role in this disease. An old cholecystitis of ten years' standing, perhaps with gall stones commencing to accumulate and steadily growing in size and number may be present together with mouth infection. Then there is a considerable number of cases in which we have chronc arthritis obtaining coincident with tuberculosis, and the speaker is convinced that there are a considerable number of individuals who have had secondary infection arising perhaps from the mouth or some other source, in which infection of the thyroid gland leading to atrophy of that organ and therefore a lessened thyroid activity resulted in the bringing about of a condition of a lessened metabolic rate for the individual, and made recovery impossible even though the primary focus of infection be removed. A series of such cases has recently passed through my hands,—one in particular in which the symptom complex presented casts and albumen in the urine, and a chronic arthritis of the right arm and shoulder of more than two years' duration. There was cessation of casts and albumen when the pulpless teeth were removed, but continued pain and tenderness and inability to manage the left arm with comfort. The metabolic rate in this case was minus thirty. The administration of a tenth of a grain of Burroughs Welcome and Company's thyroid extract three times a day with no other medication has within the last six weeks been followed by complete freedom from pain and normal use of the arm and shoulder. Whether this be a coincidence or not is impossible for me to state, but it proves that a study of all the conditions that make for a spread of secondary infection from primary foci must be given complete consideration, and the more intimately the medical and dental professions cooperate the better it will be for both medicine and dentistry. It is the personal feeling of the speaker that the dental profession stands to receive greater benefit from this cooperation than perhaps does medicine, because of the fact that the educational attainments of the dentist are at the present time greatly less than those of the medical graduate, so that the kind and sincere cooperation and help granted to the younger profession by the older profession will not only cement friendship of value to

both, but will result in great good to the people served by both.

I compliment Doctors Tuohy and Mentzer not only for the paper itself but for the spirit which actuated their cooperation in the production of so valuable a document.

A CONSIDERATION OF THE TREATMENT OF LESIONS OF THE THYROID GLAND*

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For many years the thyroid gland was believed to function as an external protection to the larynx and trachea. Some observers believed that it emptied by a duct into the larynx, or into the pharynx or esophagus, and so had some influence on digestion. It was also believed to have something to do with the control of the circulation to the brain by direct influence on the carotid arteries. Most of these hypotheses were undoubtedly fanciful. We have only recently come to regard this ductless gland of great importance in metabolism. Our knowledge of the function of the thyroid has been obtained largely from a study of the results of total removal of the gland and a study of persons whose thyroids had never functioned.

The absence of the thyroid produces a syndrome termed myxedema, or hypothyroidism. Children with total absence of thyroid function are known as cretins; in development they never reach the stage of puberty. After complete thyroidectomy the rate of metabolism is very greatly reduced; the growth of the osseous system is arrested, especially in the long bones, the skin becomes myxedematous, and the intellect is disturbed. If the thyroid is removed from young animals the skeletal development is retarded. This is especially noticeable in the nervous system and the genital system. The skin becomes infiltrated with mucinoid substances and is dry and rough. The hair and nails are brittle. If the thyroid is removed from an adult animal, the results are the same except that the skeleton is already fully developed and does not change.

Very little has been accomplished to change the condition of cretinism in the human being. Some of the difficulties that result from the absence of the thyroid gland can be overcome by the administration of thyroid extract, or of thyroxin, the active principle of the gland. The greatest difficulty arises from the fact that cretinism is not recognized until the condition is of long standing. A great deal might be accomplished if it were possible to recognize the condition early and institute treatment at once. Most cretins are found in institutions for the feeble minded and are several years old before any treatment is started. The change that occurs after the prolonged use of thyroid gland products is very striking, but this improvement continues only to a certain point. Many of the patients improve under the treatment and are able to walk and get about, and some of them grow several inches in height and seem brighter. At this stage there is a disappointment; apparently no matter how long the treatment is continued or what dosage is used, no further change can be made. In a few cases we have transplanted normal thyroid tissues, and in some, the thyroid tissue from a hyperplastic thyroid of a patient with exophthalmic goiter, but apparently with similar results.

Many cretins have adenomas and cysts in the thyroid. Sometimes the cysts become quite large and in several instances we have enucleated them with as little disturbance to the glandular tissue as possible, but the procedure has not offered much encouragement. Much more is accomplished with the myxedematous patient who at some time has had a normally funtionating thyroid gland than with the cretin. All the changes which have taken place in the skin, hair, and nails, as well as the facial expression and mental condition, return to normal in a very short time after thyroid products are administered.

Myxedema is undoubtedly much more common than we realize and unless we are constantly mindful of its evidences it is not difficult to overlook the real condition. Quite often it is present when there is no discernible lesion in the thyroid and no history of former trouble. It is sometimes seen in patients in whom there has been a long standing adenomatous or colloid goiter, and not infrequently in those in whom apparently there has been hyperthyroidism at some previous time. I have seen several cases which followed what apparently in the beginning was thyroiditis.

Postoperative myxedema is extremely rare.

*Presented before the Sioux Valley Surgical Association, Sioux City, Ia., January, 1921.

For many years we believed we had never seen myxedema following thyroidectomy, but since we are better able to recognize the condition we believe that some deficiency in the thyroid function occasionally follows operation on the gland. This of course can be best determined by an estimate of the basal metabolic rate after the operation. We found that it was not unusual for the basal metabolic rate to drop after partial thyroidectomy but that the drop apparently had no influence on the convalescence, and that frequently there was not clinical evidence of insufficiency in thyroid function. Apparently in operating for goiter, if a small piece of thyroid tissue is preserved with a good blood and nerve supply insufficient thyroid function will not result. It seems to me this is the better way to determine the amount of thyroid gland that must be saved in subtotal thyroidectomies, rather than to designate a quarter or a sixth or a tenth of the gland, or of one lobe. Experimentally, a dog develops just as quickly and completely with all of the thyroid gland removed except one small viable piece as with the entire gland. Following the employment of roentgen ray exposures in the treatment of lesions of the thyroid some cases of myxedema and some of tetany are being reported.

The tetany following operations on the thyroid is an interesting study. The syndrome is the same which may occur under other circumstances. Last year we observed two cases of gastric tetany following gastro-enterostomy for ulcers of the stomach. Apparently the conditions were synonymous, and in the one instance the patient's response to the treatment was the same as that following treatment for tetany with goiter. Tetany is much more common than myxedema following operations on the thyroid although it does not occur in more than 0.25 per cent to 0.5 per cent of all cases. It is more liable to follow secondary operations when partial thyroidectomies have been performed, possibly some years before, and the second operations are performed for recurrence of thyroid enlargement. In my experience the symptoms almost always begin by a sensation of stiffness in the fingers about the third day after the operation. It is difficult for the patient to raise his fingers to his mouth or to hold anything. These symptoms may pass off in a few hours or a day, possibly after one or two doses of morphin, or the condition may gradually progress until the contractions involve not only the fingers but the muscles of the hands and arms, and sometimes they become general. Cases in which this condition has resulted fatally have been reported, athough in our series of approximately twenty cases, there have been no deaths. One patient who had a suppurative pericarditis as well as tetany did not recover, but we were able to control the contractions. In one of my patients I was obliged to ligate both inferior thyroid arteries at the same operation; this patient developed tetany. All af the circulation to the parathyroids come from the inferior thyroid artery so that when both of the inferior vessels are ligated at the same time the parathyroids are deprived of their circulation. The tetany in this case persisted for seven weeks; it then subsided and there was no return of the symptoms. Collateral circulation was undoubtedly established and the parathyroids resumed their function. I believe that all patients should have intravenous injections of calcium lactate, 10 c. c. of 5 per cent solution in 100 c. c. salt solution at the time of onset. The calcium lactate administered by mouth, through the bowel, or subcutaneously controls these spasms although several doses at intervals may be required before the contractions stop. By the intravenous administration all symptoms usually subside within half an hour. Often one intravenous treatment is all that is necessary although if there is any tendency to recurrence the dose should be repeated. Undoubtedly these cases of postoperative tentany are caused by a disturbance of the blood or nerve supply to the parathyroids at the time of the operation or by trauma to the parathyroid gland itself; therefore symptoms persist until the gland recovers from the trauma, or until collateral circulation is established.

In all cases, the patient may be assured that after thyroidectomy normal mentality and all normal functions will be maintained. In performing the thyroidectomy, we always endeavor to preserve all apparently normal thyroid tissue.

For purposes of treatment and other considerations, enlargements of the thyroid can best be considered in five groups. In the first group are adolescent goiters, in the second group, me-

chanical goiters, in the third group, toxic goiters, in the fourth group, inflammations, and in the fifth group, malignant goiters.

Group 1. The adolescent or physiologic goiter in former years offered many difficulties in diagnosis. The enlargement in the thyroid is general throughout the gland and may attain considerable size. There may be a few small associated adenomas but usually the enlargement is due to an increase in the colloid in the gland. The patient at this time in life in liable to be nervous and to have tremor so that it is most important to make sure whether the condition is hyperthyroidism or whether the signs are all due to the adolescence. In many cases the distinction can be made by clinical evidence alone because in adolescent goiter there is no loss of weight or strength, and the tremor differs from that with hyperthyroidism. It is most important to distinguish the two types because an adolescent girl should not be operated on, even if we believe the symptoms to be due to a slight overactivity of the thyroid. If there is true hyperthyroidism surgery is the method of treatment preferred. In case of doubt conservative measures should be employed first. If the metabolic rate changes greatly and particularly if there is a marked loss of body weight the condition may quite definitely be termed true hyperthyroidism. In some instances the adolescent goiter continues to enlarge, the colloid deposits increase, adenomas form in the gland, and may become a mechanical goiter.

Group 2. The mechanical goiter produces symptoms only by pressure and interference with the surrounding structures. Usually it is large and troublesome because of its size, although a small adenoma may produce more difficulty than a large one, or, two small tumors may be placed so as to cause great interference. Usually pressure on the trachea causes difficulty in breathing; this is the first symptom, particularly if the patient has a cold. Pressure may be made on the pharynx or esophagus and produce trouble in swallowing or it may be made on the larynx or recurrent nerves, causing a disturbance in the voice. The larynx and trachea may be markedly displaced by irregular enlargements in the thyroid. The circulation is often interfered with, the superficial vessels over the lower neck and chest are markedly dilated, compensating the deep pressure.

Group 3. There are two distinct types of toxic goiters, both of which may cause mechanical interference; they are chiefly disturbing because of the so-called toxemia which they produce. This toxemia is a result of overactivity of certain elements of the thyroid or the result of the absorption of some new product from the thyroid into the circulation. In some of the toxic cases in which there is a definite obstruction to the air passages the toxic features may be produced by a suboxidation, but on the other hand many of the most toxic cases show no mechanical interference.

Exophthalmic goiter is usually toxic from the beginning. The gland is generally enlarged and hyperplastic, and there is an accompany exophthalmos. The second type of toxic goiter is usually a so-called innocent of possibly adenomatous goiter that has been in existence for nineteen or twenty years when the signs of hyperthyroidism develop. Exophthalmos is not common with adenoma with hyperthyroidism and the other features are different from those in exophthalmic goiter, but there is much evidence of toxemia and a severe general disturbance. The actual disturbance of function and the degeneration of tissue are more marked than in cases of exophthalmic goiter. Any form of iodin administered to these patients exaggerates all symptoms; this treatment frequently seems to help the patient with exophthalmic goiter.

Surgery offers the best results in cases of toxic goiter. A very large percentage of patients can be cured completely and permanently by thyroidectomy. On the other hand a few cases clear up spontaneously, and some are benefited by different forms of conservative treatment. Sub-total thyroidectomy cures about 70 per cent of cases of exophthalmic goiter and improves many others with very slight risk from the operation.

Group 4. Thyroiditis does not occur often but when it does it may present an interesting picture. The onset is usually gradual in an apparently otherwise normal gland, although sometimes it occurs in a gland in which there had been adenoma and colloid enlargements for some time. At the beginning the inflammation involves the entire gland. There is apt to be a

complaint of pain and soreness and much tenderness on touching the gland which usually is not large, but the enlargement is general. The condition may go on to suppuration. The function of the thyroid may be disturbed by the inflammation. At first there may be nervousness, tremor, and loss of weight, and other suggestions of hyperthyroidism, but as the process continues the thyroid tissue is gradually destroyed and there are definite signs of hypothyroidism. If there is evidence of suppuration I believe that it is best to open into the softened area and drain. As a general rule when the inflammation involves the entire gland I do not believe that it is a good policy to operate. The operation is difficult due to the fact that there are firm adhesions between the entire surface of the gland and the surrounding structures and furthermore it is difficult to determine what gland tissue can best be saved. Normal thyroid function is more apt to follow conservative treatment than thyroidestomy.

Group 5. Malignant tumors of the thyroid fortunately are rare. Sarcoma is almost never seen and carcinoma in much less than 1 per cent. Carcinoma of the thyroid which can be diagnosed as such from its hardness and attachment to the surrounding tissues may be considered inoperable. Even the cases of carcinoma operated on early are prone to recur and in a comparatively short time. It is to be hoped that with the development of the treatment of malignancy by radium something can be offered these patients.

The question is often asked by patients, "What will happen if the goiter is not removed?", or, "Is it necessary to have this goiter removed?" They often ask whether the goiter will ever become malignant, whether it will continue to increase in size, produce nervousness, or prominence of the eyes. It seems to me that it is fair to the patients to tell them that they need have little fear of malignancy, but if they notice the adenoma growing harder or if there is any other change after a long quiescent period the tumor should be removed. In several patients on whom I have operated for malignant enlargements of the thyroid, the enlargements had been noticed for twenty years or more and yet in nearly every instance the patient came for treatment because there had been some recent change. At the time treatment is sought for carcinoma the condition is almost hopeless.

Often ordinary goiters develop to a certain size and then remain quiescent for years. Sometimes in women at menopause the enlargement takes on new life and grows larger. It is also at this time that the adenoma with hyperthyroidism type of toxic goiter develops. The patient with a simple goiter may be assured that there is very slight chance that prominent eyes will develop, although after some years she may become nervous and have the other symptoms of a toxic goiter.

All things considered the adenomas should be removed. It is certain that no other treatment will cause them to disappear although it is equally certain that some persons may live to advanced age with goiter. If the goiter is a diffuse enlargement made up more of colloid than adenoma I believe there is a possibility that it will reduce in size and disappear.

CONCLUSIONS

Deficiency in thyroid function is manifested by a definite clinical syndrome. In most instances in adults these symptoms disappear following the administration of the active principle of the thyroid gland. In cretins without thyroid function at any time the amount of change that can be produced by giving thyroid is limited.

Disturbances in the parathyroid function result in a definite clinical syndrome. The symptoms in these cases apparently can nearly always be controlled by the administration of calcium lactate.

The adolescent goiter is a physiologic enlargement of the thyroid and should not be mistaken for hyperthyroidism. Studies in metabolism will often differentiate the two.

Thyroid enlargements producing mechanical interferences and those resulting in toxemias are best treated by surgical means.

Malignant enlargement if seen early should be operated on although very little will be accomplished by attempting to remove the tumor if it is fixed to the surrounding structures.

PUNCTURE OF THE ANTRUM OF HIGHMORE*

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Puncture is a universal measure in the diagnosis of empyema of the antrum of Highmore. That more complications do not occur following puncture is fortunate, but I am convinced that all the alarming incidents, more or less serious, are not discussed in the literature.

TECHNIC OF PUNCTURE

The usual manner of anesthesia is to insert a cotton pledget moistened with a solution of 10 per cent cocain into the inferior meatus in contact with the nasal wall of the antrum. After from six to ten minutes a trocar is inserted through the bony wall into the antrum. Some operators make the entrance in the region of the natural ostium in the middle meatus. After the antrum has been entered air is usually gently forced into the sinus through the trocar in order to make certain that the membrane has been penetrated. If pus is present in any quantity a gurgling sound is heard. When the value of puncture of the antrum is doubtful, irrigation is resorted to. Antrum puncture is essential to an accurate diagnosis of empyema. Roentgenologic interpretations are unreliable at best, but are useful in determining the size of the sinus and therefore are often a guide in investigating an antrum by diagnostic puncture. In roentgenograms I have daily noted very dark antrums which were absolutely free from infection. Also it is not uncommon for an antrum that appears normal in the roentgenogram to be infected. The most common causes for the mistaken diagnosis from the roentgenograms, are, first, unilateral thickening of the bony walls of the antrum, second, thickened periosteum or mucous membrane lining the antrum, third, hypertrophic turbinates on one side of the nose, fourth, deflected or fractured septum, and, fifth, poor roentgenograms or incorrect interpretation. The roentgenogram of an antrum will be most successfully interpreted by the rhinologist who is familiar with the intranasal conditions and who is accustomed to reading the plates.

COMPLICATIONS

Syncopy. While the picture of a patient in syncopy is classical, the fact that it occurs during the puncture of the antrum makes the comparatively unimportant condition seem serious. However, the pulse is usually regular, although feeble; there is little cyanosis; definite clonic or tonic twitchings are uncommon when the head is lowered the patient rapidly recovers.

Drug poisoning. If cocain is used in rather concentrated proportions cocain poisoning may occur. The picture of poisoning may be as varied as it is serious. In slighter poisoning the patients are langorous, excited, or delirious. In more severe cases the pupils are dilated, vomiting is frequent, and the pulse and respiration are always irregular. In the most serious cases clonic contractions are present and death occurs from paralysis of the heart and respiration. Poisoning also occurs from the use of cocain or novocain, but more frequently from the cocain since it is about five times more toxic. I am quite certain that many phenomena during antrum puncture are attributed to drug poisoning, because such reactions are feared, rather than on a careful analysis of the symptoms. In other words, when cocain anesthesia is used exclusively in a large number of cases alarming symptoms of poisoning are rarely experienced.

Laryngeal spasm. Laryngeal spasm does not often occur. It is caused by the anesthetic, by air, or by the sudden penetration of the irrigating solution into the larynx and trachea, causing a more or less complete spasm of the larynx. This is accompanied by some cyanosis, excitement, and coughing which are relieved rapidly without serious results.

Air embolism. When air is forced into the antrum air embolism occurs instantly causing paresis, and partial or complete paralysis of a definite portion of the body. Death may occur before the entrance of the air can be arrested. The localized paralysis is usually temporary, but it may be permanent. If a vital center is affected by the embolism death is immediate.

Emphysema. When air is forced into an antrum, emphysema of the surrounding soft tissues not uncommonly results, due either to a

*Presented for publication November 18, 1920.

dehiscence in the bony wall of the antrum or to the fact that the trocar was not passed completely through the periosteum or mucous membrane of the antrum. Such a complication may not in itself be serious. The air is absorbed in from a few hours to a week. The crepitation and the time of its occurrence establish the diagnosis.

Orbital cellulitis. This complication is infrequent and due to a puncture of the bony orbit by the trocar at the time of its introduction into the antrum. It is most common when entrance to the antrum is gained through the middle meatus. The signs of inflammation of the orbit occur usually from the first to third day and are unquestionable. Emphysema of the orbit may also occur if air is forced into the orbital tissue.

Shock. The typical picture of shock is not infrequent following antrum puncture. The symptoms usually are quite mild and transient, occasionally alarming, and they may even result in death. Shock occurs in debilitated persons, usually in those on whom the antrum puncture is done with care and realization of the risk. The most constant symptoms in shock are those simulating faint with a low weak pulse, cold perspiration, and pale skin. After proper care the patient improves, but remains weak much longer than the patients who suffer from syncope.

Hysteria.—Trauma may elicit peculiar phenomena inexplicable by any organic change and for the want of recognizable symptoms they must be classed as hysteria. They occur in persons whose history and physical findings give no hint of any organic change and whose general make-up is universally recognized as neurotic. The symptoms produced from antrum puncture in these persons may simulate any or all known complications except death. The patients usually exert themselves to wild movements of all parts of the body and make noises which are distinct from those heard in patients suffering from pain. They rarely hurt themselves and seldom are relieved by sympathy and advice.

EXPLANATION OF COMPLICATIONS BY THE REFLEX THEORY

In a recent article by Gording very careful and thorough investigation of the complications from puncture of the antrum are reported. The literature is reviewed, and reasons for the occurrence of complications are shown.

Gording proved that air or any solutions forced into an antrum may reflexly cause serious complications. The theory of nasal reflexes has been accepted for three or four decades. The reflexes are believed to proceed from the sensory nasal nerves to the central nervous system, through the vagus to the heart and lungs, and through the phrenic nerves to the respiratory muscles. The antrum, being supplied by the same sensory nerves as the nasal mucosa, is undoubtedly subject to similar reflexes, which can be produced experimentally and with uniform results. The practical application of this work lies in the fact that certain complications of antrum puncture present unusual phenomena most satisfactorily explained by the reflex theory. (1) The complications occur immediately after the air or fluid is introduced into the antrum; (2) respiration ceases at once in the more serious cases during any phase of respiration, but usually during expiration; (3) the pulse continues after cessation of respiration and usually is quite regular; (4) the blood pressure remains unchanged or may even be increased; and (5) tonic or clonic contracture may or may not be present.

Four cases of complication following antrum puncture reported herewith occurred in approximately 12,000 consecutive cases in the Section on Oto-Laryngology and Rhinology of the Mayo Clinic between July 1, 1917, and October 1, 1920. A fifth case (Case 4) is reported of a patient who came to the Clinic because of complications following puncture of the antrum elsewhere.

REPORT OF CASES

Case 1 (236839). Miss D. P., aged 23, came to the Clinic, July 5, 1918, for relief of neuralgic pain over the left cheek and forehead. Examination of the nose revealed pus in the left middle meatus. A diagnostic puncture of the antrum was made in the usual manner and on irrigation pus was found. Air was gently forced into the antrum without incident. Two days later a trocar was passed into the antrum through the hole made by the puncture. The antrum was irrigated and as soon as air was forced into the antrum the patient became cyanosed and respiration ceased. Artificial respiration was instituted at once and the patient recovered rapidly. The pulse remained good throughout the short time of the accident. The patient noticed that her right cheek felt

numb and on examination the lower two divisions of the fifth nerve were found not to be functionating and the arms apparently were paralyzed. The arms felt normal within a few minutes and the paresis of the nerve cleared up in the course of a few hours. Air was forced into the antrum on many occasions later without incident.

I believe that the cause of the respiratory failure in this case was a reflex contracture of the bronchioles as a result of the air being forced into the antrum. The paresis of the arms and the lower two divisions of the fifth nerve is a mystery. The first thought is of embolism, but this is very doubtful because, first, the paresis was transient and, second, because at least two emboli would have been necessary to cause the paresis of the face and arms. The patient was extremely neurotic. Hysteria could very easily produce the picture and no doubt was wholly or partially responsible, but the exact cause of the complication is indefinite.

Case 2 (*246332*). Mr. T. S. R., aged 37, examined Sept. 21, 1918, was referred from the medical section for examination of the nose on account of the nasal obstruction. Large multiple polyps and pus were found throughout the right side of the nose. In order to determine what operative measures on the antrum were necessary a diagnostic puncture of the right antrum was made at the time the polyps were removed. One attempt to get a trocar through the thick bony wall of the inferior meatus into the antrum failed. The next day it was accomplished with considerable force. The sound of air inflation was clear; the antrum was irrigated without removing the trocar. As soon as the fluid entered the antrum there was a marked swelling around the right eye and right cheek. Irrigation was stopped; the patient was put to bed with ice bags and the following day the eye and cheek had returned to normal.

I believe this was a clear case of a dehiscence in the antrum wall and the resulting escape of fluid into the soft tissues.

Case 3 (*250237*). H. C. A., a man aged 42, came for examination in the Clinic Nov. 5, 1918, chiefly because he had had almost daily severe bilateral frontal headaches since an attack of influenza five weeks before. He had suffered from such headaches for five years but following influenza they were worse. They began about midnight and lasted until morning and were intensified by stooping, coughing, and sneezing A discharge had escaped from the nose the last three weeks. A family history of pulmonary tuberculosis worried the patient. He had been weak, nervous, and unable to continue his business after having the influenza, but he had not felt strong the last five years.

The general examination revealed rales in both apices. The roentgen ray of the chest showed some bronchial thickening. The patient had a leukocytosis of 11,000. The Wassermann test was negative. There was a seborrheic dermatitis about the scrotum, anus, and legs. On examination of the patient in the Section on Oto-Laryngology, pus was found on the posterior pharyngeal wall. The left bulla ethmoidalis was enlarged and edematous. A moderate combined type deafness, more pronounced in the right ear, was noted.

A diagnostic puncture of the left antrum was decided on in order to rule out this sinus. A small pledget of cotton moistened with 10 per cent solution of cocain was placed in the left inferior meatus and after six minutes removed. A trocar was inserted into the antrum without any trouble and air was forced into the antrum. The patient fell over at once. Respiration apparently ceased in expiration. The patient was not cyanosed, and there were no twitchings or convulsions. A pulmotor was used for two and one-half hours. A medical consultant reported a pulse palpable at the wrist for about one-half hour after the patient was apparently dead.

Necropsy revealed air embolism of the heart, lungs, liver, spleen, and greater circulation, chronic valvular endocarditis, severe dilatation of the right auricle and ventricle, subsiding bronchopneumonia, bronchiectasis of the right base, chronic parenchymatous nephritis, and hyperplasia of the spleen. Because of the air found throughout the greater circulation and viscera, air embolism was named as the cause of death by the pathologist.

That the air in the circulatory system and viscera was not the cause of the death cannot be proved, but since respiration stopped immediately on puncture and the heart continued to beat for some time, air embolism may be ruled out as the chief cause of death. Moreover the amount of air injected in the puncture was infinitely less than the amount found at necropsy; this fact may best be accounted for by the action of the pulmotor in forcing air into a vessel in the mucous membrane of the antrum and so causing the immense amount found at necropsy. Death, I believe, can be explained best by respiratory failure caused by reflex stimulation, resulting in respiratory paralysis.

Case 4 (*314288*). B. M., a girl, aged 4, was brought to the Clinic May 1, 1920. Six weeks before her mother had noted a swelling over the right side of her nose. The lump was hard but neither red nor painful. Six weeks later a local physician had been consulted, who believed the condition to be empyema of the right antrum, and a diagnostic puncture of the antrum was made. Immediately the right eye became swollen shut and the surrounding soft tissues were red and prominent. The doctor and the child's mother decided to come to the Clinic at once.

At the time of our examination the child had some pain but it was not excruciating. A roentgenogram revealed that the upper wall of the right antrum and the oribital wall were much more dense than the wall of the left antrum. A diagnosis was made of empyema of the antrum with definite and marked orbital cellulitis resulting from an antrum puncture. Local suction treatment was instituted, followed in four

days by a window resection into the antrum through the right inferior meatus. On the sixth day there was fluctuation in the lower eyelid, and a large deep incision was made with the escape of much pus. The child was treated daily for three months. At the end of this time the orbital cellulitis had subsided, and the antrum infection was cleared up but the lower lid showed a slight ectropion caused by a small draining fustula in the center of the original incision. A plastic operation on the lower lid will have to be done later.

The orbital cellulitis and infection of all the soft tissue about the eye and cheek, was undoubtedly caused by the insertion of the trocar through the antrum and bony orbit into the orbital fat.

Case 5 (*313653*). Mrs. L. F. K., aged 51, was examined in the Clinic June 8, 1920. The patient had had nasal discharge and headaches since a number of upper teeth had been extracted two years before. On examination of her nose pus was found on the floor of the left nares. A diagnostic puncture of the left antrum was decided on. A small pledget of cotton moistened with 10 per cent cocain was inserted in the left inferior meatus for six minutes and the puncture made. Air was forced into the antrum, and the gurgling sound typical of the presence of pus was heard. Irrigation proved pus to be present and air was again injected to force out the fluid. No unusual incident was noted until at a second repetition of the procedure six days later, air was forced into the antrum after irrigation had been finished. Emphysema occurred immediately around and below the left eye and in the left cheek. The stream of air was stopped and the patient put to bed with cold compresses over the affected area. Within twelve hours the emphysema had disappeared.

The cause of this accident is difficult to explain. It was not due to improper insertion of the trocar because air was injected without incident before irrigation. The trocar was left in place until the accident occurred. It is most likely that the air injected under greater pressure than the first time was forced into a dehiscence in the wall of the antrum. After the patient's rapid recovery the antrum had repeated injections of air and liquids in the subsequent treatment of the infection without any symptoms.

SUMMARY

Inasmuch as complications occur from antrum puncture it is the duty of specialists carefully to perfect the technic so that every possible means of error is eliminated, and to observe certain details.

The swab of cotton used in anesthetizing need not be large if it is placed at the point the puncture is to be made.

The anesthetic solution should not be concentrated and should only moisten the cotton.

The actual puncture should be made with force under perfect control. Care should be taken to make certain that the periosteum and mucous membrane of the antrum have been pierced. The opening may even be enlarged as an extra precaution. If much bleeding accompanies the puncture, the procedure should be postponed a day or two in order to allow the blood vessels to close. Air should be introduced by means of a hand bulb, and, if more pressure is desired for a diagnosis, air under low pressure may be used with precaution. The solution for irrigation should also be introduced with care. It may be preferable to puncture the antrum through its normal ostium in the middle meatus.

If any objective or subjective changes occur during puncture the procedure should be interrupted at once.

BIBLIOGRAPHY

1. Gording, R.: Serious complications in the puncture of the maxillary antrum. Investigations, by experiments on animals, of the reflexes produced from the mucous membrane of the antrum. Air emboli after antrum puncture. Octa Oto-Laryngologica, 1920, ii, 25-104.

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EDITORIAL

LIFE EXTENSION

The study of vital statistics is of special interest to the medical man. It must be recognized that conclusions derived from such a study, to be at all valuable, must be undertaken by experts.

An interesting article appeared recently in the Literary Digest which presented the views of Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company, and Dr. Eugene Lyman Fisk, Medical Director of the Life Extension Institute.

Their experience establishes, quite well, the fact that in recent years the mortality rate in the United States has shown a definite decline. This does not mean, however, that Americans live to a riper old age than formerly, but the contrary is true; for the progress made in the fight against infant mortality has saved so many lives that the actual shortening of life of the average American has been more than counterbalanced.

That the general death rate should be actually lower than it was twenty years ago is quite surprising when we consider the greater complexity of life which has developed in even this short space of time. Deaths from automobile accidents alone, in one county of our state for 1920 numbered thirty-six. The total for the country can be surmised. How the death rate can have shown a decline during the past five years, in spite of the influenza epidemic and the war, is almost incredible.

It is the belief of Dr. Fisk that there is a marked rise in the mortality rate in the years just beyond the meridian of life, which is typically American. This is attributed to an increase in the incidence of cardio-vascular and nephritic disease. One of the main reasons for the Life Extension Institute is the combating of these diseases through early detection and the institution of proper personal hygiene as well as medical treatment.

Dr. Dublin, in a further inquiry into this apparent shortening of the span of years, has made the interesting discovery that the native born American of native parentage lives to as ripe an old age as his forefathers. The foreign element, however, is shorter-lived and shows a high mortality in the years just beyond middle life.

It is reasonable to suppose that certain factors account for this difference. The native American can be assumed to be better situated economically. The vulgar rich constitute only a small percentage of the total, and the dissipation generally attributed to at least some of these would not materially affect the sum total. Better incomes afford more opportunity for relaxation, and although we Americans do not compare with the Britishers or even our cousins, the Canadians, when it comes to physical or mental recreation, we are improving in this respect. While physical exercise is desirable, the laboring man or woman is, on the average, not to be compared physically with the better paid and brainier individual when the three score year mark is reached.

The medical profession will do its share towards the prolongation of life as it concentrates on the diagnosis of early degenerative change, and cooperates with a distinct tendency on the part of the laity for periodical preventive examinations.

CONTAGIOUS DISEASES AND THE SCHOOL

It is the general experience in City Health Departments that contagious diseases are much more prevalent in the winter months than in the summer. The school is in a large part responsible for this fact. Close contact in the school room offers ideal opportunity for the spread of diseases, whether proven of bacterial origin or not, through the actual transfer of the bacteria by sneezing, coughing, actual touch, or what not. Recent experience in the army only served to confirm the advantage of distance and fresh air in the maintenance of the health of the individual soldiers.

Vaccination will definitely prevent a certain number of diseases, namely: small pox, typhoid and para-typhoid, and probably diphtheria. The likelihood of contracting whooping cough and influenza may possibly be diminished through vaccination. Universal vaccination will ever receive opposition, and authorities disagree how far vaccination should be carried in school children particularly. The recent wave of smallpox which has just been sweeping the entire country, though not malignant, has been costly from the standpoint of suffering and expense. The present paratyphoid epidemic in our State University is regrettable. The universal prevalence of diphtheria is anything but negligible. The seasonal prevalence of influenza, probably in excess of the average although it is too early to determine definitely, is probably the burning out of the epidemic wave which reached its height in the fall of 1918.

Universal repeated vaccination in the schools would prevent the bulk of the smallpox, typhoid and diphtheria.

The necessity for daily health inspection in the schools in the control of disease cannot be overemphasized. Most cities have far too few school nurses. The parochial schools, with an enrollment almost equal to that of the public schools, have little or no health supervision. Even a perfunctory observation of the pupils, if it amounts to no more than checking up those returning to school following an absence, prevents much contagion. However, as long as the "common cold" is ignored much will be left to be desired in the control of school contagion.

An interesting phenomenon has been noted by the Detroit Department of Health which suggests the value of school health inspection. The following shows the shifting of the prevalence of scarlet fever and diphtheria from autumn to spring, as shown by the mortality statistics.

Scarlet Fever.

Years	Autumn (Oct. to Dec.)	Spring (April to June)
1900-04	27	21
1905-09	34	23
1910-14	14	35
1914-17	16	38

Diphtheria

Years	Autumn	Spring
1900-04	40	18
1905-09	35	20
1910-14	33	20
1914-17	30	27

It is quite reasonably suggested that school inspection being on the increase in recent years, accounts for the more gradual approach to the height of the prevalence curve. In other words, if it were not for the school nurses these contagious diseases would quickly spread soon after the schools opened in the fall and the incidence would decrease towards spring.

Those informed realize how epidemics would thrive were it not for the work of the school nurse and physicians, and the cooperation of the local Health Departments.

NEW ASSISTANT EDITOR

The Journal is pleased to announce the acquisition of the services of Dr. Everett K. Geer as Assistant Editor. Dr. Geer's special interest will be the Book Reviews.

This department of the Journal has in the past reviewed only books submitted by publishers. In the future such contributions will comprise the majority of the books reviewed. Certain exceptionally good books however appear which are not numbered among those submitted for review. The Journal would appreciate reviews by any of its readers of any books as they appear which are of particular value in their special spheres.

WHO FIRST GAVE CHLOROFORM IN MINNESOTA?

Asa W. Daniels, M. D.
Pomona, California.

By whom and where chloroform was first given in Minnesota may become an important historical question in the future. Although chloroform was discovered in 1844, it did not become generally used by the profession until after 1850. The larger cities and the army were the first to adopt it officially. At that time Minnesota was a territory, becoming a state in 1857, therefore we could not expect its early use there. My claim for having first given chloroform in Minnesota rests upon an operation performed near Fort Ridgley, June 1854, where chloroform was given.

In June 1854 Fort Ridgley was in the course of construction, and was not fully completed for several years. It was a three company post, one hundred and twenty-five miles west and south of St. Paul, on the north bank of the Minnesota river, built to protect the whites from the Indians. The Sioux Indians, by treaty, were located twelve miles west, where the government was assisting them to become farmers.

Dr. Hassen, Army Post Surgeon at the Fort, had secured a leave of absence for three months, and it was arranged that I should act as his substitute during his absence. My service commenced early in June 1854. Soon after, a messenger came from Joseph Lafrombois, a Canadian French Indian trader, living four miles west of the Fort, stating that his son, eighteen years old, had been seriously hurt by gunshot, and that I should make all speed possible in coming to his relief. Taking the hospital steward and the necessary medicines and instruments, we were soon on our way.

Reaching our destination, it was seen that a band of Indians were there in camp—their tepees surrounding the house and trading post. The room where the injured boy lay was filled with Indians—all anxious to learn of his condition. The father was told that nothing could be done until the room was cleared. All soon left the room, with the exception of a half dozen Indian doctors, who begged to remain, that they might tell their people what was done by the White man's doctor.

The father told me that while his son was handling his gun the discharge took place when his hand was on the muzzle; that the bleeding had been alarming, and they had tried to assuage it with bandages. It was found on removing the clothes that the hand had been blown to fragments, and that an amputation was necessary. The father was so informed, but that chloroform would be given, and the operation would be without pain. The amputation he had expected, but of the chloroform he had never heard.

Chloroform was given, the boy responding nicely to its anesthetic effects. The operation was proceeding in the usual manner, when the mother—an Indian woman—rushed from the room wailing bitterly. The cry was taken up by the women outside, and the whole camp was soon in an excited condition. Nevertheless the operation was progressing, and I asked the father the cause of the disturbance. He said that one of the Indian doctors had told the mother that the boy was dead; that frightened her and the cry commenced. On being assured that the son would come from his sleep "all right" after the operation, the excitement slowly quieted down. The amputation completed, the boy soon came out of his sleep to the delight of his parents and the whole Indian band that had shown such a sympathetic interest in his recovery.

All wanted to know if there had been pain, if he was sick from the strong medicine, and if he knew of the operation. To all of which he declared that he knew nothing after breathing the medicine—all was nothing but quiet sleep. All were happy over the result, and the doctor was praised from every camp. Declaring that he was Pazuta Wechaster Wahcon—"the medicine man possessed by the Great Spirit."

For two weeks the boy came to the Fort for the hand to be dressed. His recovery was uneventful. He grew to manhood in that vicinity, and was well and favorably known.

209 W. Pearl St.

NEWS OF THE HOSPITALS

On the evening of April 6th the Mounds Parks Sanitarium held a monthly alumni meeting.

St. Lukes Hospital, St. Paul has enlarged the windows of the lower floor to promote the comfort of patients throughout the summer months.

St. Johns Hospital has been entirely repainted and redecorated and a basal metabolism apparatus has been installed. Dr. T. L. Birnberg, chief of the Pediatric Division, has completely recovered from his operation and is again serving on the staff. Miss L. Gilkey, a graduate of the hospital in 1919, was recently appointed Night Supervisor.

Miss Ida Hummel, Assistant Superintendent of the Eitel Hospital, Minneapolis, attended the A. N. A. convention which was held at Kansas City from April 8th to 13th.

Recently the Northwestern Hospital, Minneapolis, erected a new ward, which will contain sixteen beds for convalescent men patients.

The South Side Sanitorium, Minneapolis, is undergoing a complete renovation.

Four needles have been added to the radium supply of the Swedish Hospital, Minneapolis; this institution is contemplating the erection of a new Nurses' Dormitory, which will accommodate about one hundred nurses. A swimming pool and other such recreational facilities are to be features of the new building.

On May 10th the annual meeting will be held at Fairview Hospital, Minneapolis. It is reported several new members will be added to the staff at that time. The hospital will be completed throughout by June 1st, when it will be possible to admit seventy-five additional patients.

On March first the Asbury Hospital, Minneapolis, was formerly opened as U. S. Public Health Hospital, Number Sixty-eight.

St. Mary's Hospital reports that it has transferred all of its convalescent service men to Asbury Hospital.

OBITUARY

J. C. Farmer, M. D., McKinley, Minn., University of Minnesota 1895; member St. Louis County Medical Society and Minnesota State Medical Association; died Feb. 10, 1921.

Flora L. Aldrich, M. D., Anoka, Minn., University of Minnesota 1887; died March 19, 1921.

John C. Stout, M. D., Oakland, Calif., American Medical College, St. Louis, 1878; aged 74; died January 7th, 1921.

ARTHUR J. GILLETTE

In the death of Dr. Arthur J. Gillette, Minnesota and the Northwest has suffered a great and enduring loss. He was a pioneer in the field of Orthopedic Surgery and when that specialty was still in its infancy he brought Minnesota to the front rank in this field. He caused Minnesota to see, appreciate and attack the problem of the crippled child a long time before most of the States realized that such a problem even existed. As a result—there stands today the model Institution at Phalen Park—a monument to its founder and a dispenser of past, present and future blessings the value of which can never be measured in terms of money alone.

It is unnecessary to write of Arthur Gillette's prominence in the field of Orthopedic Surgery; of the many honors bestowed upon him by the Associations of which he was listed a member; of his numerous and able contributions to the literature of his specialty. All of that is a matter of record and is well known.

In him there passed away a man; a real and lovable man. He was of unexampled bouyancy and good cheer which radiated from him and contributed not a little to his great professional success. He was of wide culture and interested in many of the fine things of life outside of his profession. To the younger members of his profession he was always a wise and honest counselor and a good friend. He excelled as a teacher; his enthusiasm was contagious. His lectures were masterpieces because he was a master of his subject. Those who knew him best loved him most.

EMIL GEIST.

MEMORIAL
to
ARTHUR J. GILLETTE, M. D.

The name of Arthur J. Gillette has to be added by the Faculty of the Medical School of the University of Minnesota to the long chapter roll of its remembered and honored dead. To review the record of his life is to measure the regret of his associates that he has gone.

Success comes to many, as it came to him; but success with distinction is won, as he won it, by few. The genial nature, the kindly humor, the punctilious courtesy, the careful professionalism, like the diagnostic fingers and the analytic mind of the man, were peculiarly his own. There was a strongly personal quality in everything he did which made for the large sum of appreciation he received from his fellows.

He was essentially a son of his State. One of the pioneer students of medicine in Minnesota, he attended the Minnesota Hospital College from 1883 to 1885; he transferred his allegiance to the reorganized St. Paul Medical College in 1886; and he graduated in that year. In 1903 he took the ad eundem degree of the University of Minnesota.

In 1895 he began his notable career as a medical educator, accepting, first, an instructorship in Orthopedia; becoming a clinical professor in 1897; a full professor of orthopedic surgery in 1898; and taking charge of this Division in 1913.

In 1915 he resigned, as he said "in favor of some younger and better man". Urged by the Faculty to withdraw his resignation, he consented to continue his work but left his resignation in the hands of the school to be considered whenever the time should come to determine the limit of his usefulness. That time did not come and his resignation, still on file, has been accepted by death.

The one great ambition of his life, The Hospital for the Crippled and Deformed at Phalen Park, the first institution of its kind in America, stands as his personal and professional monument. He conceived it; he inspired the gift of the acreage upon which it stands; he framed and promoted the legislation which created it; he superintended its construction; he directed its activities throughout its history; he determined that its staff should be of the University Faculty. A model of its kind, a noble institution of the State, an educational asset to the University, it has been, under his inspiration, more than all these,—a place of light and leadership, of human love and human service.

Service was the key-note of the like of Arthur Gillette; its one great purpose to promote the happiness of the handicapped. The smiles and the laughter of little children whose lives he lengthened, whose sufferings he assuaged, whose deformities he corrected, whose health he restored, whose usefulness and satisfaction he assured, will be his welcome in the world to which he has gone, as they were the light and the music of the world that he has left.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

AMERICAN MEDICAL ASSOCIATION

The annual meeting of the A. M. A. will take place this year in Boston, Mass., June 6-10. Physicians contemplating attending this meeting are referred to information regarding railroad rates from Minnesota given on page 1013 of the A. M. A. Journal of April 9, 1921. Identification certificates may be procured from Dr. A. R. Craig, Sec. A. M. A., 535 No. Dearborn St., Chicago. The special round trip rate of a fare and a third from Minnesota to the New England boundary is of particular interest to physicians in Minnesota.

The American Proctologic Society will hold its twenty-second annual meeting in Boston June 3, 4 and 6, 1921. The headquarters will be at the Hotel Braemore.

The fifty-second annual meeting of the American Medical Editors' Association will be held at the Hotel Lenox, Boston, on Monday and Tuesday, June 6th and 7th, 1921, under the Presidency of Dr. H. S. Baketel, editor of the Medical Times. A novel feature of the literary program will be introduced this year in the shape of a symposia, which will be discussed by various members. The subjects will be: "Group Practice and the Diagnostic Clinic"; "What should be the Attitude of the Profession toward Health Centers", and "The Correlation between Editorial, Advertising and Subscription Work". Every doctor, even remotely interested in medical journalism, will find it to his advantage to attend, and is most cordially invited.

The Minnesota Pathological Society of the University of Minnesota Medical School held a meeting on Tuesday evening, April 19th. The program was conducted by Drs. W. E. Camp, Harold Rypins, George D. Head and Reuben A. Johnson. Discussions were opened by Dr. H. L. Ulrich and Professor Leory S. Palmer.

OF GENERAL INTEREST

Dr. W. G. Strobel, formerly of Welcome, is now associated with the Duluth Clinic.

Dr. Charles L. Sherman, of Luverne, has been spending the past few weeks in California.

At a recent election of city officials at Bemidji, Dr. E. A. Shannon was again elected city physician.

Dr. Thurston William Weum, of Minneapolis, announces the removal of his offices to 607 La Salle Building.

Dr. B. S. Bohling, of Sandstone, is in Chicago for a month where he is doing special work in one of the large hospitals.

Dr. Robert Emmett Farr, of Minneapolis, has been invited to present a paper before the New York

State Medical Association in Brooklyn, on May 5th, 1921.

Dr. R. I. Stewart, of Wendell, was recently appointed medical examiner for the Bureau of War Risk Insurance for Grant County.

Dr. and Mrs. William MacCarty, of Rochester, have recently been in the East. Dr. MacCarty attended a medical meeting at Cleveland.

Drs. K. A. Danielson, A. W. and W. P. Robertson, of Litchfield, attended a recent meeting of the West Central Minnesota Medical Society at Willmar.

Dr. R. D. Gardner, of Eveleth, has moved to International Falls where he will engage in the practice of medicine. He will be associated with Dr. B. F. Osborn.

Dr. and Mrs. J. L. Adams, of Morgan, who have been residents of that place for over thirty years, have gone to Van Nuys, California, where they will make their future home.

Dr. A. H. Nerad, who has been practising medicine at San Diego, California, for the past two years, has recently located at Argyle, Minnesota, and is associated with Dr. A. S. Holland.

Dr. Ben Gallagher, who has been connected with the Mayo Clinic at Rochester since his return from service, is now located in Waseca where he will be associated with Dr. Swartwood.

Dr. G. A. Miners, who has recently completed two years work in the General Hospital, Minneapolis, has located at Brownton, Minnesota, where he will engage in the practice of medicine.

Cloverton, Minnesota, is without a physician. This is a very prosperous community, well settled and thriving. Full information as to this location can be obtained by addressing A. N. Langelier, Box 21, Cloverton.

Dr. William C. MacCarty, of Rochester, recently addressed the Public Health meeting, which is the second of a series of lectures arranged by the Public Health Committee of the Civic and Commerce association of that city.

Dr. Royal N. Chapman, Assistant Professor of Entomology, of the University of Minnesota, delivered a lecture March 15th before an open meeting of the Mayo Foundation Alumni Chapter of Sigma Xi; his topic was, "The significance of ecological research in entomology and its application to certain problems of national interest".

The Associated Physicians Clinic, composed of fifty Minneapolis physicians, has filed articles of incorporation with the Secretary of State . The incorporators, who also comprise the board of directors, are: Drs. Arthur T. Mann, Henry C. Stuhr, John M. Lajoie, Arthur E. Benjamin and Frank S. Bissell. Dr. Bissell has been elected secretary of the clinic.

Dr. Edward Lissack, of Concordia, Missouri, who has recently become associated with Dr. H. A. Miller, of Waseca, Minnesota, wishes a correction made in the news item which appeared in the April number of MINNESOTA MEDICINE. Dr. Lissack is not a specialist, but a general practitioner, giving special attention to the diseases of the eye, ear, nose and throat.

The Interrurban Academy of Medicine held a clinical meeting in Duluth and Superior on March 16, 1921. Surgical and medical clinics were conducted in St. Luke's and St. Mary's Hospital, Duluth, and St. Mary's Hospital, Superior, during the day, and the evening meeting was addressed by Dr. T. R. Martin and Dr. W. E. Ground. There were about twenty-five visitors and it is planned to have a much more elaborate and extensive meeting sometime during the coming summer.

NEW AND NON-OFFICIAL REMEDIES

During March the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies.

Abbott Laboratories:

Tablets Acriflavine-Abbott 0.46 Grain.

Armour & Co.:

Ampoules Pituitary Liquid-Armour 0.5 Cc.

Hynson, Westcott & Dunning:

Sterile Ampoules of Benzyl Benzoate-H. W. D.

E. R. Squibb & Sons:

Arsphenamine-Squibb.

Neoarsphenamine-Squibb.

Sodium Arsphenamine-Squibb.

Acriflavine-Heyl.—A brand of acriflavine (see New and Non-official Remedies, 1921, p. 22). Heyl Laboratories, New York.

Proflavine-Heyl.—A brand of proflavine (see New and Non-official Remedies, 1921, p. 23). Heyl Laboratories, New York.

Calcium Cacodylate-IPCO.—A brand of calcium cacodylate (see New and Non-official Remedies, 1921, p. 50). Intra Products Co., Denver, Colo.

DuBois Iodoleine, Injectable, Ampoules, 2 Cc.—Each ampoule contains 2 Cc. of DuBois iodoleine (see New and Non-official Remedies 1921, p. 153). David B. Levy, New York.

Tincture of Digitalis Fat-free-Squibb.—A biologically standardized fat-free tincture of digitals corresponding in drug strength to the U. S. P. tincture of digitalis. E. R. Squibb & Sons, New York (Jour. A. M. A., March 5, 1921, p. 655).

Solution Arsphenamine-Lowy 1 per cent.—An aqueous 1 per cent solution of arsphenamine, possessing the proper degree of alkalinity. The solution is supplied in ampoules containing 40 Cc. (0.4 Gm. arsphenamine) and 60 Cc. (0.6 Gm. arsphenamine). These ampoules should not be used after the date stamped on the label of each package or if the degree of coloration of the solution is greater than that of a control tube which accompanies the package. A sterile needle for intravenous injection and sterile rubber tubing accompanies each ampoule. The Lowy Laboratory, Inc., Newark, N. J.

Ampoules Pituitary Liquid-Armour 0.5 Cc.—Each

ampoule contains 0.5 Cc. pituitary Liquid-Armour (see New and Non-official Remedies, 1921, page 222). Armour & Co., Chicago, Ill.

Tablets Acriflavine-Abbott 0.03 Gm.—Each tablet contains 0.03 Gm. acriflavine-Abbott (see New and Non-official Remedies, 1921, p. 21; Jour. A. M. A., March 26, 1921, p. 859).

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.
THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

THE TREATMENT OF ADVANCED HEART FAILURE: Cary Eggleston (Med. Clin. of No. Amer., July, 1920). The subject is considered under four main divisions: (1) General management; (2) Use of drugs acting upon the heart; (3) Symptomatic treatment; (4) After treatment and prophylaxis.

Rest, both mental and physical, is the most effective measure we have for relieving the work of the heart. The patient should assume whatever position he prefers. Sleep is even more important than rest. Sedatives and hypnotics should be used when possible rather than morphine. Chloral hydrate is the most effective and safest of all simple hypnotics; useful to combine with the bromides. When necessary use morphine.

The diet should be simple, readily digestible, and not too abundant and of relatively low protein content. The bowels should be evacuated daily, and not allow patient to strain.

For direct influence upon the heart and circulation the members of the digitalis group are alone of importance. For the purpose of very rapid digitalization one may employ the body weight method. The relief of edema may be had by salt and fluid restriction or by the Karell diet. Theocin and theobromin are of value.

The first essential is to treat the patient until the damaged heart has regained the maximum of reserve power left. The prevention of a recurrence of heart failure should be begun during the period of convalescence.

FRANK W. SPICER.

THE PREVENTION AND SERUM TREATMENT OF LOBAR PNEUMONIA: Russell L. Cecil (Med. Clin. of No. Amer., July, 1920). Statistical evidence has shown that pneumococcus vaccination does establish an immunity. At Camp Upton, 12,519 men were vaccinated with a pneumococcus vaccine of Types I, II and III, and no cases of these types developing. In a control of 20,000 men, 26 cases developed. Strangely enough, only 17 cases of Type IV and the streptococcus pneumonia developed among the group of 12,519 men, while there was a total of 173 cases of all types among the control of 20,000.

In a series of cases of pneumococcus Type I pneumonia, at Rockefeller Institute, treated with pneumococcus Type I serum, the mortality rate was 7 per cent, while in the untreated with this serum, the mortality was 25 per cent. Experiments on monkeys corroborate clinical evidence.

Cecil describes the method of serum administration and says: "The points to be emphasized in serum treatment are: (1) The administration of serum at the earliest possible moment; (2) Frequent injections of serum; (3) Sufficiently large doses of serum. Failure to achieve favorable results is usually due to violation of some one or more of these rules."

The author calls attention to the thermal reaction, the anaphylactic reaction, and the serum sickness, and concludes by stating that "we have in Type I anti-pneumococcus serum a therapeutic agent of great power and efficacy".

FRANK W. SPICER.

THE TREATMENT OF NEUROSYPHILIS BY THE INTRASPINAL ROUTE: Albert Keidel and Joseph Earle Moore (Johns Hopkins Hosp. Bul., Nov., 1920). The authors report a clinical study made by them on twenty-five cases of neurosyphilis treated from the point of view of increased permeability of the meninges. They review the objections by some of the principal authors to the intraspinal form of treatment, and also discuss the question of permeability of the choroidplexus and the meninges. Their own method of investigating the latter was essentially the administration subdurally of small amounts of mercury (Method of Byrnes) followed in twenty-four hours by an intravenous injection of arsphenomine. Maximum irritation of the meninges and maximum arsenic concentration in the blood were expected in this formula to be attained at the same time. A course of treatment comprised usually a series of six weekly administrations.

Clinical details in their twenty-five cases are given in tabular form.

They conclude that their own method is unsuccessful. Serological results were particularly bad. The unfavorable comparison to the Swift and Ellis method or to the Ogilvie modification thereof was quite striking.

Incidentally they noted also the unfavorable comparison between the Byrne and the Swift and Ellis methods in their own cases, as well as in those of other observers.

Attention is also called to experiments on different animals reported in the literature to demonstrate permeability of the choroid plexus. The inconsistent results obtained from various species of animals, they feel, suggest the possibility of a selective menin-

geal activity hitherto unmentioned and it would seem therefore difficult to assume that in man spinal drainage or the production of aseptic meningitis increased the permeability for drugs on the basis of animal experiment.

The authors' conclusions are:

1. Intraspinal therapy is a necessary and rational adjunct in the treatment of neurosyphilis which fails to respond to routine antisyphilitic treatment.

2. The mode of action of intraspinal medication does not depend upon increased permeability of the meninges.

3. Aseptic meningitis produced by intraspinal injection of irritants may prove an untoward rather than a beneficial factor in the treatment of neurosyphilis.

J. C. MICHAEL.

THE INFLUENCE OF PROTEIN FOOD ON INCREASED BLOOD PRESSURE: Herman O. Mosenthal, (Amer. Jour. of Med. Sc., Dec., 1920.) The author states that he has been led to make the studies, the results of which he presents in this article, (1) because of the popular opinion which exists among members of the medical profession that protein food has a definite influence on high blood pressure, that a diet high in proteins has been supposed to raise blood pressure, and vice versa, and (2) because of the indiscriminate application of this principle in any and all disease associated with hypertension by prescribing a diet low in proteins, especially in meats, for all patients exhibiting an increased arterial pressure. The author feels that the above ideas have been based on rather meagre evidence and that concrete evidence of carefully observed cases has been largely lacking. To furnish such concrete evidence he presents selected case reports of patients on whom, in the interest of accuracy, the following careful regime has been carried out:

(1) The patients were kept in bed for several days before the studies were begun in order to allow the arterial tension to assume the lower level which mental and physical relaxation bring about.

(2) The manometer readings were made at approximately the same time each day.

(3) The patients were kept in bed continuously and over a long period of time.

(4) The low protein diet as prescribed contained no meat, meat products or fish, while the high protein feeding contained large amounts of these same foods.

The cases as thus studied show:

(1) That neither a high nor a low protein diet have any remarkable effect upon the blood pressure in a few days.

(2) That there is no notable change in the level of the arterial pressure on a high or a restricted protein intake, while the total number of calories is maintained at a constant level.

(3) That the low protein diet is effective in producing a diminution in the blood urea nitrogen, but the blood pressure remains unchanged.

(4) That a diet low in protein but with total caloric value increased results in no change in the arterial tension.

(5) That there is a tendency for a diminution of the blood pressure with a diet very low in protien and low in caloric value.

As a result of the above studies the author concludes:

(1) That it is exceptional for a low protein diet to diminish the blood pressure or a high protein diet to raise it, admitting, however, that this may occur.

(2) That the diminution of the waste products of the blood as indicated by a lowering of the blood urea nitrogen is without affect on the blood pressure.

(3) That changes in the caloric value of the diet for a short time at least does not influence the blood pressure.

L. S. YLVISAKER.

DIAGNOSIS OF DISEASES OF THE PANCREAS WITH SPECIAL REFERENCE TO DIASTASE IN THE URINE: R. L. Mackenzie Wallis, St. Bartholomew's Hospital, London. (Quart. Jour. Med., Oct., 1920.) The object of this paper is to apply various functional tests for pancreatic activity to a series of cases and then sum up the evidence obtained.

The difficulties of diagnosis of pancreatic disease, both by clinical features and functional tests, are recognized. The clinical features include the symptomatology of lumbar pain, tenderness, the occurrence of tumor with its consequent pressure effects, deep epigastric pains radiating to the right shoulder, emaciation, anemia, the occurrence of bulky stools and urinary changes are noted, with exploratory laparotomy as a last resort.

There are two kinds of tests for the functional activity of pancreas: 1st those depending upon the digestion of foodstuffs; 2nd those relating to internal secretion of pancreas as it effects Carbohydrate Metabolism.

I. The tests for digestive ferments are carried out in stomach contents or feces, and depend upon their diminution or absence.

a. Azotorrhea.
b. Steatorrhea.
c. Diastase.
d. Oil Test Breakfast (doubtful value).
e. The Schmidt Test Diet.
f. The Sajodin Test (test unreliable).

II. Tests depending upon other functions of pancreas.

a. General character of the urine.
   1. Bile pigments.
   2. Indican.
   3. Calcium Oxalate.
   4. Absence of Ethereal Sulphates.
b. Diastase content of the urine.
   Marked increase in pancreatic disease.

The urine content follows closely that of the blood in absence of kidney pathology.

c. Cammidge reaction.
The author is of the opinion that the results are not commensurate with time required.

d. Loewi Test.
Believed to be of considerable importance.

e. Glucose Tolerance Test.
Of importance but other conditions such as disturbed liver function may give a positive test.

The author's "Tripod" are:

1. The diastase content of blood, and urine.
2. Loewi Test.
3. Glycosuria.

The transitory character of these tests are noted and the following conclusions derived at.

1. Value of functional tests.
2. No one test sufficient.
3. "Tripod."
4. Accessory—creatorrhea—steatorrhea.
5. Transitory character of these phenomena.
6. Investigation negative in Diabetes Mellitus.
7. Certain tests of no value (oil test meal, Sahli test, Cammidge, Sajodin test.)

THOMAS ALBERT PEPPARD.

SURGERY

SUPERVISORS:
E. MENDELSSOHN JONES
LOWRY BLDG., ST. PAUL.
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

THE DIAGNOSIS AND TREATMENT OF HYDROCEPHALUS RESULTING FROM STRICTURE OF THE AQUEDUCT OF SYLVIUS: W. E. Dandy (Surg., Gynec. and Obst., 1920.) Hydrocephalus is always secondary to a primary cause which should be located in every instance, although its discovery, while at times simple, is usually difficult. The cases are divided into two groups: (1) communicating and (2) obstructive. Nearly all cases of hydrocephalus are due to an obstruction, but in the so-called obstructive group the obstruction is in some part of the ventricular system. In the communicating type, the ventricles are in communication with the subarachnoid space and the obstruction, usually adhesions, lies in the various parts of the subarachnoid space. The differential diagnosis is accomplished by injection of one cubic centimeter of indigo carmine into a lateral ventricle. If, on lumbar puncture, the dye appears in the spinal canal, there is communication between the ventricles and the subarachnoid space. This type is known as "communicating". The absence of the dye in the spinal fluid denotes an obstruction at some point in the ventricular system; this type is called "obstructive."

All the cases studied have essentially the same microscopic pathology. In each instance, only epithelial remnants of the lining ependyma remain, and an hypertrophy of the glial tissue replaces the defect. Some of the author's cases showed occlusion of the entire length of the aqueduct of Sylvius. The presence of a meningocele should always create a suspicion of an accompanying hydrocephalus, although the cause of this not infrequent association is unknown .

An occlusion of the aqueduct of Sylvius can be localized accurately. It is first necessary to prove the existence of hydrocephalus, second to determine the type an finally, if obstructive, to locate the obstruction. The diagnosis and the degree of ventricular dilatation can be determined with absolute accuracy by ventriculography. When moderately advanced, not infrequently the condition can be recognized by x-ray without ventriculography. Careful weekly measurement of the head should always be made until any suspicion of hydrocephalus is allayed or verified.

The author proposes a new operation for the cure of hydrocephalus. A rubber catheter is introduced into a newly formed aqueduct. The tube is left in place for as long as possible, but usually will require a secondary operation for its removal. The object is to allow the formation of a new aqueduct. Two patients have been operated on, one of whom died, the tube remaining in place two weeks. The tube was in place in the other patient, who seems well one year after operation, for a period of three weeks.

In concluding the author calls attention to cicatricial stenosis as the most frequent lesion in congenital hydrocephalus. The stenosis may occupy part or the entire length of the canal.

J. A. BUCHANAN.

CLINICAL CONSIDERATIONS OF OSTEOMYELITIS: A. J. Ochsner, and D. W. Crile (Surg., Gynec., and Obst., 1920, 31, 263-276.) Osteomyelitis is an inflammatory disease of bone usually originating in the medulla. The staphlococcus, streptococcus, typhoid baçillus, and pneumococcus organisms are most often causative. This disease affects boys three times as often as girls and involves the femur and tibia in a large proportion of cases. Abscesses usually develop within twenty-four hours of the onset. Epiphysitis occurs in 12 to 15 per cent of the cases and between the second and seventh day.

Sequestration of the diseased medullary bone takes place in two weeks while the removal of cortical bone may require four to eight weeks. Repair of bone is carried on by bone elements left clinging to the periosteum and nourished by the vessels of the periosteum. The new involucrum is often of poor quality.

Symptoms in osteomyelitis are proportionate to the grade and severity of the process; thus, pain may be excruciating or entirely absent. The x-ray in the early stages is of little or no value except in a negative way.

Treatment consists in the earliest possible surgical drainage, splitting and reflection of the periosteum,

and free opening of the medullary cavity in the involved area. The marrow should be removed with a curette and the walls of the cavity washed with carbolic acid solution (5 per cent), Dakin's solution, or tincture of iodin. The cavity should be packed with iodoform or plain gauze, especially in the acute stage, to prevent the accumulation of a blood clot which may lead to continued suppuration. The wound should be left open. Amputation is not indicated even in the most desperate cases.

After-treatment consists in the removal of the gauze packing on the second or third day. If frank pus is present in the medullary cavity or has burrowed into the soft parts, rubber drainage tubes or Carrel's method of sterilization is instituted.

Success in the treatment of chronic osteomyelitis depends on (1) removal of absolutely all dead tissue and (2) provision for filling the remaining defect. This is accomplished by leaving the cavity empty and closing the wound by a double row of continuous catgut sutures, the first as tension and the second as coaptation sutures. A large dressing with several splints is applied for immobilization until the blood clot which develops is thoroughly organized. Failure to appreciate the importance of preventing any disturbance of the clot has been a factor in most of the bad results following the use of this method.

Recurrences are most often due to re-infection from foci overlooked at the primary operation. Infected teeth and tonsils, trauma, excessive carbohydrate consumption, cold, and exposure are other factors in recurrence.

A. C. JOHNSON.

THE RESULTS OF OPERATIONS FOR INGUINAL HERNIA PERFORMED IN THE JOHNS HOPKINS HOSPITAL FROM JANUARY 1, 1899 TO JANUARY 1, 1918: Adrian S. Taylor (Arch. Surg., 1920, 382-406.)

The author reviews the work and observations of Halsted and Bloodgood with regard to inguinal hernia, and directs attention to the original technic and subsequent modifications. From January 1, 1899, to January 1, 1918, 256 operations for direct, and 2,230 operations for indirect inguinal hernia have been performed in the Johns Hopkins Hospital. The results of operation were ascertained by examination or by letter from the patient or his physician in 816 cases. There were thirty recurrences in 356 patients with indirect hernia examined at the hospital while only sixteen recurrences were noted in 460 patients who reported by letter. It is probable that the actual number of recurrences is greater than the figures indicate, because the patients evidently easily overlook the condition. In 770 patients who were cured six years have elapsed since the time of operation, and the average time after operation in forty-six recurrent cases was forty-two months. Seventy-seven of the 256 patients operated on for direct inguinal hernia were heard from; seventeen of these had recurrences on an average of 8.6 months after operation.

In determining the factors in recurrence, it was noted that when excision of veins was practiced in cases of indirect hernia hydrocele occurred in 20 per cent of cases, as against 3.8 per cent without excision. In the direct type non-excision carried only a 2.2 per cent recurrence as against 77.7 per cent in patients treated by excision. When local anestesia was used the recurrences were 12 per cent in the indirect and 18.1 per cent in the direct type.

In forty-eight cases of indirect hernia with obliterated conjoined tendon eighteen recurrences (37.5 per cent) were found as against six (31.5 per cent) of nineteen cases of direct hernia. Infection of the wound caused a 25 per cent recurrence in the indirect, and a 50 per cent recurrence in the direct hernia.

When the rectus muscle was transplanted for indirect hernia, recurrences were present in nine of twenty-two (40.9 per cent), while the same procedure employed with the direct herniation gave only a 25 per cent unfavorable result. By transplanting a flap from the rectus fascia a 100 per cent cure was obtained in thirteen cases of indirect hernia. This method was used in three cases of direct hernia with one recurrence. In nineteen cases of cord transplantation in indirect hernia, seven recurrences (36.8 per cent) were present, three were found at the site of the transplanted cord, while a 25 per cent recurrence was found in the direct heria.

The cord was split and the veins alone transplanted in forty-four cases of indirect hernia; the percentage of recurrence was 18.1 per cent, while in three cases of direct henia no return occurred.

Excision of the cord was practiced successfully without recurrence in twenty-five cases, four of these being direct.

Mortality rates in 2,486 operations since 1899 show nineteen deaths in the hospital, seven due to strangulated hernia, four to pulmonary embolism, one to myocarditis, two to meningitis, four to pneumonia, and one to status lymphaticus in an infant of seventeen months. The total mortality was 0.76 per cent or with exclusion of deaths by strangulation, 0.48 per cent.

A brief outline of the operative technic devised by Halsted is given. The important features of this are high ligation of the sac, perfect hemostasis, and suture of the cremasteric muscle to the under surface of the internal oblique muscle. The cord is not disturbed. The edges of the conjoined tendon and internal oblique muscle are sutured to Poupart's ligament, and the flaps of the external oblique muscle are overlapped. Halsted's method of using a flap from the anterior sheath of the rectus fascia in the case of a narrow or thinned, conjoined tendon is shown. Transplanting the cord is, as yet, an unsettled problem, but, as now practiced, appears to increase the possibility of recurrence.

The author calls attention to the use of the cremaster muscle in obtaining a solid closure. In all cases of recurrent hernia the overlapping of the ex-

ternal oblique aponeurosis is permanent, while the free edge of the internal oblique muscle does not always remain permanently attached to Poupart's ligament, and may, therefore, undergo fibrous change.

A. C. JOHNSON.

ESOPHAGEAL DIVERTICULA: E. S. Judd (Arch. Surg., July, 1920.) Diverticulum of the esophagus is a comparatively rare condition, although more common than indicated by the approximately 200 operative cases reported. Fifty-four patients with esophageal diverticula have been operated on at the Mayo Clinic. The two common types of the condition are the pressure and the traction diverticula. The latter commonly occurs in the thoracic part of the esophagus, and can often be shown to be formed by the pulling out of the walls of the esophagus by some inflammatory adhesion. These traction diverticula include all the layers of the esophagus, are usually multiple, and seldom attain any appreciable size, or produce symptoms. Occasionally the sac enlarges because of pressure from inside and a traction-pressure diverticulum is produced. This conversion, it is estimated, occurs in about 7 per cent of traction diverticula.

The pressure diverticulum was first described by Zenker and Ziemssen and always occurs at a point behind the cricoid cartilage on the posterior wall of the esophagus. The arrangement of the musculature here results in a weakness in the wall of the esophagus and, through pressure in swallowing, the inner coats of the esophagus may be forced through a chink on the outer coats, and thus a simple pouch is formed. When the intra-esophageal pressure is increased, the pouch tends to increase until it becomes large enough to hold accumulated food and mucus from the esophagus. The sac of an esophageal diverticulum contains only the mucus membrane and submucosa, thus differing from diverticula in the sigmoid and other parts of the intestine. No clue to the etiology, other than a weakness in the wall of the upper end of the esophagus, could be found in the author's cases.

The symptoms are usually proportional to the size of the sac. The pressure may cause an almost complete stenosis of the lumen of the esophagus. The average age of the patients at the time of operation was 55; the symptoms rarely occurred before 45.

At the present time roentgen ray and esophagoscopic examinations are used in diagnosis, and an accurate diagnosis can be made by either one or both of these methods. In suspected cases the roentgenologic examination is made after the patient has swallowed a bismuth mixture. An esophagoscopic examination is then made to rule out the possibility of any other lesions, such as carcinoma. Dilatations of the esophagus must also be excluded; these are usually caused by spasm of the cardia or stricture of the esophagus due to scar. In one of the author's cases a congenital diaphragm was the cause of the dilatation.

The treatment of esophageal diverticula is surgical. Dilatation of the esophagus, repeated at intervals, may keep the patients fairly comfortable; but in most cases the sac increases in size, restricts the food intake, and eventually produces emaciation. On this account some patients require forced feeding before any treatment can be undertaken.

One of three types of operation may be employed. The first method is applicable when the sac is small. The sac is dissected from its bed. The neck of the sac is completely freed from the surrounding tissues and purse string and plicating stitches are placed so that when it is tucked into the esophagus and the stitches tightened, it will be held permanently in the lumen of the esophagus, where it atrophies or possibly sloughs off .

The second method is the complete excision of the sac and suture in one stage. Occasionally there is leakage from the stuture line before the pocket has become lined with a granulation berrier and in some instances the result is serious.

The third method is a two stage operation. In the first stage the sac is freed in the usual manner and the mucous membrane dissected 1 to 2 cm. from the musculature of the esophagus. At this point the neck of the sac is caught to the sternomastoid or platysma muscle with a few interrupted catgut sutures; the wound in the neck is closed around the neck of the sac, and the whole sac allowed to prolapse from the wound. Neither the esophagus nor the diverticular sac is open so that the surrounding tissues and spaces are not exposed to infection. Moreover, as the deformity in the esophagus is corrected, the patient can swallow without difficulty. At the end of 10 or 12 days there is a complete barrier of granulation tissue separating the pocket in the neck from the mediastinum. The neck of the sac is again freed and the sac excised; the opening in the esophagus and the wound in the neck are closed. No anesthesia of any kind is used in this stage, although in some instances it may be well to inject the neck of the sac with procain before excising it. If a small fistula forms, it always heals completely within a short time.

The author believes the two stage operation should be employed in nearly all instances, as it is safer. The inconvenience to the patient and the time and suffering are less than they would be if complete excision were performed in a one stage operation. If infection follows the one stage operation, it results fatally in many cases. Three deaths occurred in fifty-four cases, two following a one stage operation and the third following the first stage of a two stage operation. The ultimate functional results have been very satisfactory and in no instance has a stricture developed.

J. E. MCCORVIE.

A REVIEW OF EIGHT YEAR'S EXPERIENCE WITH BRAIN TUMORS: E. Sachs (Arch. Surg., 1920, I, 74-84.) In the author's series of eighty-five

cases of brain tumors, there were twenty-nine deaths or a mortality of 35.5 per cent. The largest mortality occurred in patients with gliomas of which there were eighteen. Tumors other than glioma were found in sixty-four patients, or about 74 per cent. Among these the mortality was only 17 per cent.

Some gliomas grow by replacing tissue and others by displacing tissue. The former do not give rise to any general symptoms of increased pressure, but produce signs of focal phenomena, irritative, or paralytic in character. A diagnosis of brain tumor may, therefore, be made, although no general signs of pressure are present. Gliomas should not be regarded as malignant tumors since they do not metastasize.

Early operation in cases of brain tumor is essential. The only successful extirpations of gliomas were in patients whose symptoms were present four months, or less. The practice of dilatory and palliative measures over months of time is absolutely wrong and unjustifiable. Every brain tumor should be treated on the basis that it may be a glioma, requiring immediate surgical treatment.

In twenty-six per cent of the author's cases the glioma was readily removable, although successful extirpations constituted but 14 per cent.

The type of operation apparently has no bearing on the mortality. The brain in which glioma occurs shows marked deformity, which should be decreased rather than increased by operation. This may be accomplished by removing the growth in several stages. Thus, in eighty-five cases 106 operations were performed.

A preliminary decompression and withdrawal of fluid by ventricular, not lumbar, puncture should be done to reduce the intracranial pressure to normal before the dura is opened. In 100 ventricular punctures no harm has resulted from the procedure.

In sixty-four non-malignant cases diagnosed preoperatively as brain tumor eleven patients died, a mortality of 17 per cent. Twelve of the patients had cysts of various types, two of which were gliomas while a third was a huge cyst replacing the vermis. Cysts may occur as a result of tentorial hemorrhage from which the patient has recovered. In two other instances there were huge porencephalic cavities. One patient revealed multiple cysts of the taenia solium.

Palliative measures often afford a surprising amount of relief, especially in cases of impending blindness and severe headache.

A. C. JOHNSON.

POST-OPERATIVE TREATMENT OF FISTULA-IN-ANO: WITH SPECIAL REFERENCE TO THE USE OF GUTTA PERCHA TISSUE: Alfred J. Zobel (Minutes Amer. Proct. Soc., April, 1920). The writer quoted that the essential difference between the general surgeon and the surgical specialist is the careful attention to detail which the latter gives to everything within the scope of his particular field of endeavor.

Watching the work of some of the better general surgeons, he has been struck by the fact, that in their rectal work, the operation itself seemed to be the only thing of importance. The post-operative treatment, particularly, appeared to be of very little consequence to them, and was often left entirely to the interne or the nurse; this accounts for a great part of the large percentage of failures which follow fistula operation as shown by hospital statistics.

The writer described his way of treating fistula cases, following operation. The wounds are first lightly, yet firmly, packed with strips of iodoform gauze which has been thoroughly vaselined, which are left in for 24 hours only. After this, strips of gutta percha tissue alone are used, over which moist boric acid compresses are applied frequently, then oiled-silk, then a dry outside pad, and the dressing is complete. Reasons for using the vaselined gauze, and the hot moist compresses, are given.

The writer further stated that the gutta percha tissue dressing allows free drainage along the sides; easily keeps the skin edges separated; does not press upon, nor injure in any way delicate granulations; does not retard healing; does not cling to raw surfaces; is easily replaced by the nurse, without fear of doing damage, should it come away when the dressings are renewed; and, most important, is removed without causing pain.

GALLBLADDER DISEASE. A STATISTICAL STUDY: Conrad Jacobson (Arch. Surg., 1920, 310-335). A statistical study of a series of 470 cases of gallbladder disease admitted to the surgical service of the Peter Bent Brigham Hospital during a period of six years forms the subject of this paper.

The author states that next to appendicitis gallbladder disease is probably the commonest intra-abdominal lesion, forming in this series about 4.2 per cent of a total of 9,484 operations for all conditions. Gallbladder disease, choecystitis and cholelithiasis, is a disease of middle age occurring with special frequency in women and closely associated with the increasing incidence of pregnancy; the greatest frequency in this series was between 40 and 50 years of age. Many cases evidently originate in early age and persist with only vague indefinite symptoms until later in life.

Gallstones are due in all probability to a hematogenous infection, commonly streptococcal, of the gallbladder and biliary passages, and are associated with an altered cholesterin content of the blood.

Symptomatically the author divides this series into four groups: (1) The typical biliary group in which a history of definite biliary colic due to the passage of the stone down the biliary passages is given; this comprises over half of the total number. (2) About 17 per cent are of the atypical biliary group in which the chief symptom is dull pain over the upper right quadrant associated with tenderness, fever, and nausea and vomiting. (3) The gastric group comprised 14 per cent; the symptoms, epigastic distress,

fullness after meals, and belching of gas, were referable to the stomach. (4) The biliary gastric group presented gastric symptoms and recurring colics.

No definite assistance in diagnosis was obtained from the analysis of the gastric contents in this series. A positive diagnosis of gallstones was made in 27.5 per cent of the cases by roentgenologic examination, the findings being confirmed at operation.

Complications of the common-duct and pancreas are of frequent occurrence in the long persisting cases. There appears to be no special dilatation of the extra-hepatic biliary passages in the slow obliteration of the gallbladder through chronic infective processes with fibrosis; but after cholecystectomy there appears to be some dilatation at or above the junction of the hepatic and common ducts.

Perforation of the gallbladder was found in six cases; a normal gallbladder was removed in sixteen instances. Recurrences are due mainly to overlooked or re-formed stones and persistence of the original infection or its extension as a chronic pancreatitis. Injury to the biliary passages during operation is due to the rather frequent abnormalities in the blood vessels and biliary passages.

Cholecystectomy is the operation of choice in cholecystitis and cholelithiasis, whenever feasible. There is marked beneficial effect in long continued drainage of the biliary passages in the complicated cases of cholecystitis and pancreatitis. So far as can be ascertained removal of the gallbladder has no special effect on the body economy.

The mortality for the whole series was 6.5 per cent. The author shows that there is an increasing mortality rate with the increase in the complications and urges an early recognition of and early operation for gallbladder disease.

FRED R. SANDERSON.

OBSERVATIONS ON THE BLOOD PRESSURE IN CASES OF PROSTATIC OBSTRUCTION: V. J. O'Connor (Arch. Surg., Sept., 1920) has made a study of blood pressure changes occurring during the drainage period of patients with prostatic obstruction.

Complete drainage of the bladder in patients with marked urinary retention, either by an indwelling urethral catheter or by suprapubic cystotomy, is followed by a fall in blood pressure. This decrease in the blood pressure is most marked in patients with hypertension and a large amount of the residual urine. The extent of the drop seems to depend on the amount of the residual urine and the degree of reduction of renal function.

There was no difference in the degree of blood pressure change in patients drained by suprapubic cystotomy and those in whom a urethral catheter was used. The greatest drop in blood pressure was noticed during the first 24 hours. In 60 per cent of the cases the systolic blood pressure continued to fall during the second twenty-four hours in 40 per cent no further reduction occurred; and in 85 per cent no decrease in the diastolic blood pressure took place during this period.

Patients operated on at a time when their blood pressure was still decreasing often showed a marked postoperative fall in blood pressure.

Patients whose bladders are adequately drained will eventually reach a stage at which the blood pressure is maintained at a definite, non-fluctuating level. During this period the adequate renal function and satisfactory general condition indicate that the patient is in the best possible condition for operation. This level or equilibrium of blood pressure is generally reached after about two weeks of bladder drainage and in most cases is lower than before drainage.

In a number of patients who were examined several months after operation it was found that the blood pressure has remained at a level which shows an average decrease of from 65 to 10 mm. of mercury.

A. J. SCHOLL, JR.

RIB GRAFTING OPERATIONS FOR THE REPAIR OF BONE DEFECTS AND THEIR END-RESULTS AT LETTERMAN GENERAL HOSPITAL: L. Eloesser, (Arch. Surg., 1920, 72, 428.) In bone-grafting operations, the author selects the ribs as furnishing the best material for bone transplants. It was believed that a thin, highly viable, vascular graft, with soft cortex and a large amount of cancellous tissue produces better results than a bone with thick, dense cortex and little or no cancellous tissue. Absorption of osseous tissue and deposits of permanent bone take place more rapidly in such a graft, thus permitting an earlier return of function to the limb.

Gallie states that the processes of absorption outstrip those of replacement and therefore cancellous bone, such as rib, should not be used when the graft is to be placed under strain or when the gap to be bridged is wide and rapid absorption is not desired.

The author's series seems to show that the very tardiness with which massive grafts are absorbed is a distinct advantage inasmuch as a thin, frail graft may be absorbed before the osteoblasts are prepared to lay their bony deposits on it.

The practical advantages of the rib graft consist in the unlimited supply, its easy accessibility, its comparative tubular strength its viability, and the short postoperative stay in bed.

The technic of rib-grafting is not difficult being essentially the same as for any other graft. The front part of the fifth or sixth ribs is usually selected, as it is straightest. The rib is removed with its periosteum without opening the pleura, which although not dangerous, is best avoided. The rib is carefully dissected away from the muscles and pleura for one or two inches; it can then be snipped off by a curved rib shears. The cut end is retracted outwards and the intercostal muscular attachment

dissected as far back as necessary. A hole is then drilled through each end of the excised rib and the graft split longitudinally with an osteotome or stout knife. Kangaroo tendons are threaded through the holes in the graft and through the previously drilled holes in the ends of the fractures; they are then threaded around the entire bone with a ligature carrier tied securely. The split portions of the graft form a trough in which lie the ends of the fractured bone. The periosteum is sutured, the soft parts brought together, the skin closed, and the extremity encased in plaster.

Variations in the application of the graft to different types of cases will readily suggest themselves. Fixation should be used for from ten to twelve weeks as Gallie has shown that two months is the average time at which absorption is complete.

In reporting his end-results, the author considers those operations successful in which firm union has taken place according to both x-ray and clinical evidence. The series includes twenty-two cases. Operations on seven of ten patients with radial defects were successes and three were partial failures. One ulnar defect, partially successful, refractured at operation. There were five patients with defects of both radius and ulna, on partial and four complete successes. All operations for humeral defects were failures. One defect of the tibia and jaw each was successfully repaired. Eleven patients had more or less suppuration following operation. Refracture occurred in seven, or almost one-third of the twenty-two cases. The bone graft always broke in the middle, the end being united to the matrix bone.

The author concludes that rib-grafting is a feasible procedure and the graft survives very well even in the presence of suppuration. The grafts absorb rapidly and hypertrophy slowly. They are inferior to tibial grafts in the repair of large defects and in the ability to bear strain. Of twenty-two cases, three were failures, thirteen were successes, and six were partial successes.

A. C. JOHNSON

SPERMATOCELE: E. T. Crossan (Ann. Surg., 1920, 72, 500). Spermatocele was found in approximately 8 per cent of testicles in two series of cadavers examined. The cyst originates in the scrotum and is or has been connected with the semen-carrying system Spermatocele may be confused with ecysted hydrocele.

In order to appreciate the condition its origin must be sought in the anatomy and embryology of the region. Structurally the cyst wall contains smooth muscle fibres from the vasa efferentia. The epithelial lining may be columnar, ciliated, or pavement in type.

Extra-vaginal cysts are usually unilocular and often pear-shaped, displacing the testicle downwards and forwards. Their origin may be the superior vas aberrans or vas efferentia. Others, primarily extra-vaginal but less common, arise from the vas deferens and paradidymis. The intra-vaginal type of cyst springs from the sessile hydatid or canal of the epididymis. These take the shape of the globus major, are thin walled, and often rupture into a hydrocele.

The contents of a spermatocele may serve as a basis to distinguish it from a hydrocele. The fluid in the former is more feebly alkaline, of lower specific gravity, and contains much less albumin than that in the latter.

Spermatoceles are almost exclusively caused by trauma, usually of a tearing character. A history of trauma to a functioning testicle, slow increase in size, pain, and the presence of a tumor of either type above described, are reasonable indications of spermatocele. A further aid in diagnosis is the symptom of swelling on sexual excitation.

Cure is accomplished by radical procedures. In cysts arising from the sessile hydatid and the vas efferentia a portion of the tunica albuginia must be removed and the defect covered by serosa. In other varieties enulcleation with ligation of the stalk may suffice.

J W. Ross.

GYNECOLOGY AND OBSTETRICS

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TYPES OF PELVIC INFECTION: Doederlein (Surg. Gyn. & Ob., June, 1920). This interesting and thoughtful study classifies pelvic infections as follows: (A) Ascending through continuity, blood or lymph vessels and includes; (1) Puerperal, and (2) Gonorrhoeal.

(B) Descending, either by continuity from local infection, appendicitis, or blood—born as tuberculosis.

Puerperal sepsis accounts for from 30 to 35% of maternal mortality, is a wound infection and 90% of the cases are due to avoidable causes. The surgeon sees only the severe cases but there are a large number of milder ones causing chronic invalidism. In the young the vagina is steril and the common bacterial flora, including varieties of staphylycoccus is innocuous. The normal secretions are bactericidal and are most active in the region of the cervix. This defense is broken down by removal of, or interference with, the normal flora and secretions, by: douches, strong anti-septics, alkaline leucorrhoea, cervical errosions, or menstruation. Puerperal sepsis is carried to the pyometrium by the lymphatics and is usually retroperitoneal. The author refers to the work of Mortiz who demonstrated a definite arrangement of the fibromuscular tissue about the cervix and lower uterine segment. This is the region primarily involved and explains the brawny pericervical inflam-

ation. Bacteriology of pelvic infection is of little value as indication for treatment. He emphasizes the danger of premature operation and accepts Simpsons well known conclusions relative to indications for operation. Operative experience demonstrates that highly virulent bacterial may become encysted and retain activity for years. Late operation on encysted foci are often more dangerous than a judiciously timed earlier one. In spite of dense adhesions the quiescent organs may function undisturbed, unlike the effects of Gonorrhoea.

As regards Gonorrhoea, infection of the vulva and vagina is most active in children while in adults it is a menace to others rather than to the patient. Ascent of the process is favored by; menstruation, labor, coitus, examination, or meddlesome therapy. Mild infection of the tubes may permit of conception and become active after labor, resulting in sterility. Involvement of the tubes and ovaries rarely threaten life, but usually destroy these structures. Operations after the acute stage are relatively safe as compared to the puerperal type of infection.

Early treatment of the acute stage of either type includes rest in bed, icebag, opium and no meddlesome measures. The more active the process, the greater is the contra-indication to aggressive local measures.

(B) Descending infection carried by continuity of the peritoneum, or through the blood stream include: 1. Colon bacilus infection from the rectum with parametritis. 2. Appendicitis with tubal or peritubal involvement. Operative proceedures with this form are comparatively safe. 3. A definite type of nonpuerperal abscess involving the ruptured follicle and corpus luteum. 4. Pelvic tuberculosis which is usually blood-born.

Concludes that: 1. Classification of ascending and descending types of pelvic infection is of value in prognosis. 2. Operations for the descending form do not present grave danger. 3. In the ascending infections differential diagnosis between puerperal or gonorrhoeal forms will determine the risk of operation.

THE VALUE OF ROENTGENOGRAPHY IN OBSTETRICS: (Under this caption a series of articles appearing in foreign medical literature have been abstracted in Vol. 1, No. 3 of the Amer. Jour. of Ob. and Gyn.) Warnekros states that advance in technic has made it possible to procure exact pictures of the fetus in utero by means of exposures of eight to nine tenths of a second. By means of a series of pictures of the same patient during pregnancy and during labor he was able to obtain "by direct observation" information concerning the attitude of the fetus during pregnancy and concerning the mechanism of labor. Where such observations do not harmonize with older views and theories, the latter must now be discarded as positively disproved. In the absence of disturbing factors, the fetal head is held in a comfortable middle flexion; the fetal verterbral column in its convexity only conforms to the shape of the uterus; there is no force or even typical attitude of the extremities; position depends solely upon available space. The above holds true for both head and breech presentations. Any deviation of this natural attitude suggests some anomoly.

Under normal conditions the head enters the pelvis without further increase in flexion; the latter occurs about the time of internal rotation and is the result of the transmission of pressure from the fundus by way of the vertebral column pushing the occiput deeper down. Internal rotation is brought about under the influence of the pelvis floor muscles. At the moment that the head is born the shoulders, contrary to common opinion, stand transversely in their normal relation to the head. There is no torsion.

Regarding the third stage of labor he concludes: The placenta, as a rule, separates first at the edge and with but few exceptions reaches the internal os edgewise and in this position glides into the vagina. In the vagina the change takes which causes it to appear by its fetal surface, known as the Schultze method. The placenta does not separate until the fetus is expelled from the uterus but it becomes detached immediately the uterus retracts over the escaping fetus as in all his pictures, though taken within five minutes, the placenta appeared wholly detached. The use of anaesthesia does not seem to alter the above.

In breech presentation as in head, the fetus assumes a comfortable attitude and the pressure of the fundus is transmitted along the vertebral column. A series of roentgenograms taken in two cases shows distinctly the spontaneous change, during the first stage of labor, of a breech presentation into a normal head. Clinical observation has always considered such a change possible but these observations offer unimpeachable proof.

Weibel agrees with Warnekros as to the time and manner of placental separation; that the actual mode of expulsion of the placenta from the vulva has no relation to the mechanism of its detachment, its final appearance being due to changes taking place in the vagina and that the terms "Schultze" and "Duncan" must disappear from obstetric nomenclature.

Vogt suggests that roentgenograms of lungs and the intestinal tract will aid in the differential diagnosis between cases of extrauterine life and those of stillbirth.

Hess suggests that the extent of ossification as revealed by the roentgenogram, rather than the older methods of measurements, will determine the age of the fetus. This test can be used when only parts of the corpse are available.

ALBERT G. SCHULZE.

ROENTGENOLOGY

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TRAUMATIC PNEUMOCRANIUM: Alfred S. Doyle, (Am. Jr. Roent. Feb., 1921, P. 73.) The subject of traumatic pneumocranium is interesting inasmuch as only a few cases of this condition appear to have found their way into medical literature within the last decade. Cases have been reported by Stewart, Holmes, Skinner, Kuckett, and one not reported by Walter Dodd. In January, 1919, Dr. Hollis E. Patter published a case which up to the present time seems to be the only one on record in which the patient appears to have made a recovery either with or without surgical intervention.

The author's case was struck by an automobile June 7, 1919. The injury resulted in lacerations of the scalp in the left supraorbital region. The patient's symptoms gradually became worse. He was first referred for roentgen examination in September, 1919. This demonstrated a depressed fracture of the cranium in the left frontal and temporal region. In addition a large air cavity was found. Operation performed September 24, 1919, showed that the air was enclosed under pressure. The patient died the following day and subsequent autopsy showed that there was free passage from the air cavity, through the ethmoid sinuses into the nasal cavity. The thick mucous found in the passage probably acted as a valve in admitting and confining the air.

The unusual features of this case were: (1) The length of time the patient lived with gradually increasing air cavity into which air constantly gained admission from the ethmoid cells and could not escape. (2) The condition was not suspected.

R. G. ALLISON.

ROENGENOLOGICAL ASPECTS OF LOWER RIGHT QUARDANT LESIONS: F. H. Baetjer and J. Friedenwald. (Am. Jour. Med. Scs. Nov. 1920.) The diagnosis of lower right quadrant lesions is a matter of great importance; not only is this because of frequent occurrence of appendicitis, but because of the lesions which are apt to present themselves in this region, the differential diagnosis of which is often fraught with much difficulty. Observations are to be made by means of the bismuth meal observed at varying intervals, and also by means of the bismuth enema.

1. Appendicitis: Case emphasizes two points: 1. The necessity of examining the patient in a horizontal position with the screen over the abdomen and the tube underneath the table. 2. The necessity of palpating the abdomen and noting the localized tenderness. When the appendix remains visible over more than a day or two after the bismuth examination, it is in proportion to its poor drainage, a dangerous appendix. When the appendix is retrocecal the caecum must be pushed aside to visualize the appendix. A great majority of these retrocecal appendices show tenderness upon direct palpation. In those cases in which there is no tenderness appendicitis may usually be excluded, but if the caecum is adherent there is always a possibility that this is due to some inflammation in the appendix in the past even if the appendix is visualized and not tender. Phafler claims that if there is localized tenderness over a fixed caecum even if the appendix is not visualized it means a pathological appendix.

The writers, however, do not believe every visualized appendix is necessarily pathologic. On the other hand when we find an appendix filled with bismuth, curled up and fixed this invariably means some pathologic process is present. The writer's experience agrees with Phafler's in the kinking of the appendix which remains constant, is a significant sign of adhesions; and when the appendix constantly points upward towards the gall bladder region there is good ground to believe it to be in a pathologic state.

When the pyloric end of the stomach is observed lying down on the lower right quadrant region, whether due to the omentum wandering toward the inflammatory process or from actual adhesions from the appendix extending into the omentum, it is a very definite indication of a pathologic appendix.

The appendix may be markedly diseased without being visible, due to an obliterated process. In cases of sub accute appendicitis on account of the inflammed state of the appendix, the meal frequently will not enter and there may be no adhesions. The only sign that can be elicited will be tenderness over the appendix region.

2. Incompetent ileocecal valve and ileal stasis; This condition shows the following phenonema: 1. When the bismuth is given by mouth we find an actual regurgitation of the bismuth from the caecum back into the ileum. 2. In giving a bismuth enema at low pressure the bismuth passes into the ileum.

3. Dilation of the caecum with retention; This condition shows retention in the caecum of the bismith meal for more than 48 hours. The patient may not complain of constipation. The bismith will become almost adherent in masses to the sides of the caecum and allow only a small channel in the center. This must of necessity cause a low grade inflammation of the caecum which will frequently extend to the appendix.

4. Tuberculosis ulcerations; The presence of intestinal hypermotility spasm and filling defects give according to Brown and Sampson in a patient with pulmonary tuberculosis almost definite evidence of colonic tuberculosis.

5. Adhesions and angulations; These conditions are usually readily recognized by means of the roentgen rays. Not only the caecum and descending

colon but also the terminal portion of the ileum is a common seat for adhesions.

6. Ulcerations due to carcinoma; In this condition there is a definite filling defect in the caecum due to carcinoma. This defect is large, serrated and constant in all the plates. In addition on fluoroscopic examination there is localized tenderness and fixation.

R. G. ALLISON.

OSTITIS TUBERCULOSA MULTIPLEX CYSTICA: Otto Jungling; (Forts auf dem Gebiete der Roent, Sept. 30, 1920.) The writer describes a case which came under observation in 1911, and later came under observation again in 1917. The patient was a boy 16 years old, whose mother had pulmonary and intestinal tuberculosis. The patient had had in his childhood a marked and chronic inflammation of the eyes. At the time of first examination there were definite signs of a healed pulmonary tuberculosis. Present illness: without special cause and without special pain, all of the fingers and toes had become swollen within a period of half a year. The degree of swelling varied, marked swelling being associated with redness and pain. In addition to the swelling there was a dilatation of the dorsal veins of the hands. Two fingers showed notty swelling of the soft tissues suggestive of tuberculosis. The function of the joints was limited only by the swelling in the soft tissues. There was no contracture formation.

Subsequent observation in 1917 showed that the condition had spontaneously altered itself in the course of several years. There was a marked retrogression which had taken place slowly, interrupted by periods of aggravation.

Comparison of the roentgenograms of 1911 and 1917 show two entirely different pictures which they termed respectively types 1 and 2.

Type 1:—The changes in type 1 involve the greatest part of the bone or the entire bone of most of the hones of the hands as well as the phalanges and metatarsals of the feet. In the marked changes the original structure of the bone is no longer apparent. The phalanx is plump, the whole bone shows a honeycombed structure. The conpacta has disappeared to a thin bony shell, and even this shows a breaking thru in several places. In the metaphyses and epiphyses are the largest blister like swellings. These give the impression of the confluence of small cysts thru the disappearance of the cyst wall. The bones show a slight swelling. The joint lines are smooth and intact. At no place is there a periosteal proliferation with the exception of callus formation at the site of one spontaneous fracture.

Type 2:—The phalanges have their normal form. The diaphyses show generally no change. The compacta is definite and even seems to be somewhat thickened. The metaphyses and epiphyses are markedly swollen. These show in their centers clear areas which are round, oval or heart shaped and vary in size from a linseed to a cherry stone. These clear spaces appear like defects made with a punch chisel. The joint spaces are sharp and intact. No periosteal proliferation. Many bones show a complete restitution to integrity.

Subsequently the writers had the opportunity to study three similar cases. These cases showed changes of types 1 and 2 and all transitional stages between them. The pathological process was in one case not limited to the bones of the extremities. Otherwise the roentgenological picture was identical.

This pathological process begins in the central part of the bones of the hands and feet, breaks thru the compacta and in this way invades the subcutaneous tissues and under certain conditions can break thru the skin. The primary process is in the bone. In Lupus pernio, which this process somewhat resembles, the primary process is in the skin with secondary changes in the bone.

Consideration of the four cases showed definitely that they were dealing with a tuberculous process, the primary focus being in the bones. The writer coined the name "Ostitis tuberculosa multiplex cystica" for this pathological process.

This condition is distinct from Spina ventosa which shows diffuse swelling of the marrow part of the bone, frequent sequestra formation, periosteal proliferation, and fistula formation.

This process can roentgenologically be differentiated from Ostitis fibrosa generalisata only with difficulty. Ostits fibrosa forms solitary cysts without choice in the diaphysis, metaphysis or epiphysis. Type 2 Ostitis tuberculosa locates in the metaphysis or epiphysis only, and in type 1, where the diaphysis is involved, it is identified by its generalized honey-combed appearance.

Other bony cystic processes on the basis of parasitic infections ar malignant tumors can be easily differentiated.

The prognosis in these cases depends upon the extent of tuberculosis in other organs. This particular process is chronic but tends to spontaneous retrogression. The treatment should be the same as that for other forms of tuberculosis.

R. G. ALLISON.

PEDIATRICS

SUPERVISORS:
FREDERICK C. RODDA,
SYNDICATE BLDG., MINNEAPOLIS.
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO.

TETANY AND THE ADMINISTRATION OF ALKALIS: P. S. Henderson (Quart. Jour. of Med., July, 1920). Previous writers notably Wilson, Stearns and Janney, A. H. Howland and Marriott have reported that the administration of sodium bicarbonate is sometimes followed by a manifest tetany. Henderson's material consisted of 19 infants and young chil-

dren, nine were aged less than 18 months. Most of them were suffering with acute or subacute infections. The amount of sodium bicarbonate administered equaled that given by Howland and Marriott, and ranged from .12 grams to .92 grams per kilo per 12 hours. It was usually given over several days, in some cases as long as 23 days. The Chvostek facial phenomenon was never produced, the electrical reactions were not affected, and the clinical tetany did not occur. The author concludes that this investigation lends no support to the idea that symptoms of tetany may result from the administration of large quantities of alkali.

ROOD TAYLER.

THE DIAGNOSIS AND PROGNOSIS OF TUBERCULOSIS IN INFANCY: Charles Hunter Dunn and Samuel A. Cohen, (Amer. Jour. Dis. of Child., Feb., 1921.) In this paper Dunn and Cohen present new and interesting data on an old and very important subject. The correlation of clinical and necropsy findings on a large series of cases brings out some facts regarding tuberculosis in the first two years of life which have been hitherto, but little recognized.

In studying these cases Hamburgerer's classification of the disease into three stages was as follows: the primary stage representing the original lesion and the associated lymph node involvement; the secondary stage all the lesions produced by the further invasion of the body by the tubercule bacillus, and the tertiary all of the chronic destructive lesions of later life.

From a study of hospital records it appeared that formerly the diagnosis had been chiefly in the secondary stage when lesions such as bronchopneumonia, meningitis and pleurisy had presented themselves, and the necropsy had frequently demonstrated definite primary lesions in cases which had not been considered tuberculous.

The cases studied in this series were examined for signs of consolidation, and tracheobronchial lymph node enlargement including interscapular dulness, extension downward of normal cervical dulness and D'Espine's sign. Von Pirquet tests were made and repeated, and in every suspicious case roentgenograms of the chest were made.

From these studies, the subsequent necropsy findings in 138 cases, and a follow up system on patients who had been discharged, it appeared that when one of these signs was found a diagnosis of primary tuberculosis could be safely made. Positive or even doubtful VonPirquets indicate tuberculosis almost invariably; interscapular dulness and a positive D'Espine were found to indicate the disease in a large majority of cases (unless masked by consolidation in the lungs); and roentgenograms showing tracheobronchial lymph node enlargement were of great diagnostic value. Negative findings in any of the above did not exclude the disease. It is of interest to note that physical findings of consolidation were not as conclusive as might be desired, since unresolved nontuberculous bronchopneumonias gave a similar picture. Roentgenograms, however, usually distinguished one from the other. Military tuberculosis unless conglomerate tubercles had formed, was usually missed on roentgen examinations.

Tables are given showing that primary tuberculosis can be diagnosed with a reasonable degree of certainty in the presence of a positive VonPirquet, or a roentgenogram showing tracheobronchial lymph node enlargement—the physical signs of the latter being less conclusive. In the secondary stages of tuberculosis the clinical findings were usually sufficient for diagnosis when the VonPirquet or xray were positive or even doubtful, but little doubt as to the nature of the case remained. Necropsy and observation of cases with unmistakable lesions corroborated these conclusions, many of the cases diagnosed primary tuberculosis developing definite secondary lesions in a short time.

The importance of these studies is apparent when the prognosis of tuberculous infection in the first two years of life is considered; in this series the hospital mortality ran as high as 53 per cent. The prognosis is best when the disease is recognized in the primary stage, but since so many of these cases passed rapidly into the secondary stage it is still not at all good. It is believed that a more general recognition of the early cases, by use of the methods of examination outlined in this paper would improve this grave prognosis. Healed or arrested tuberculosis does not occur in infancy: it behooves physicians to watch constantly for the primary condition and to institute proper treatment if a suspicion of the disease exists. In this way only the high mortality of tuberculosis in infancy can be reduced.

R. N. ANDREWS.

CAN INJURY OF THE GENITAL GLANDS BY RADIATION LEAD TO THE PRODUCTION OF A PATHOLOGICAL OR LESS WORTHY OFFSPRING: Nurnberger (For. auf dem Gebiete der Roent., Sept. 30, 1920). The writer reviews the literature and gives the results of animal experiments in answer to the following problems.

1—Conditions governing conception and character of offspring after preceding exposure of the male's testicles to x-ray and other radioactive substances.

Found that the spermatozoa were not killed immediately and that if the male was put with a fertile female within 24 hours after exposure that conception would ensue. After 24 hours, however, the male was sterile. After several months, the exact time depending on the degree of exposure, there was regeneration in the testicle and the females could again conceive from these males. The offspring secured before sterility set in and after regeneration had taken place were in all cases normal.

Statistics were gathered of children of roentgenologists and roentgen workers. While it was apparent that a certain per cent of these were sterile the

children of the others, acquired while the male parent was working with x-ray and afterwards, were in all cases normal.

They concluded upon the basis of animal experiments and statistics of humans exposed to the x-ray that it was impossible to injure the offspring by exposing the testicle to x-rays or radioactive substances.

2—Conditions governing conception and character of offspring after preceding exposure of the ovaries to x-ray and radioactive substances.

Found the same relation applied here, that conception could take place within 24 hours after exposure, but that after 24 hours the females were sterile. This sterility was permanent or temporary depending upon whether or no all of the primordial follicles had been destroyed. If some had escaped they might at some later date come to maturation. Offspring conceived in the first 24 hours and after temporary sterility had disappeared were entirely normal.

The writer reviewed the statistics of females who had been exposed to x-ray and found no abnormality of the offspring. They concluded that no abnormality of the offspring would ensue from exposing the ovary of females to x-ray or radioactive substances.

3—Conditions of conception and character of offspring after preceding exposure of both testicles and ovaries to x-ray and radioactive substances.

Found that the offspring, conceived after sterility had passed, were entirely normal.

4—Condition of offspring of individuals who had been rayed during pregnancy.

Found that exposure of pregnant animals to x-ray had a deleterious influence on the foetus and the pregnancy. Abortion was apt to occur or the child be born dead. However, those offspring which were born alive were in all respects normal.

A review of statistics on humans showed that exposure of the foetus to x-ray might cause intrauterine death, but that those children which were born alive, lived and were in all respects normal.

5—Experimental observations of the second genuerations of descendants of animals whose genital glands had been exposed to the x-ray showed no abnormalities. The writer concluded that no dormant abnormalities were present in the descendants of animals exposed to radiation. The conclusions derived from the preceding observations is of marked clinical importance in that the fear of abnormal progeny following x-ray or radium treatment of gynecological conditions has no foundation.

R. G. ALLISON.

THE PREDOMINANCE OF SEBORRHEIC ECZEMA IN EARLY LIFE: Thomas S. Southworth (Arch. of Ped., June, 1920) calls attention to the part played by seborrhea in infantile eczema, and states that a predominance of eczemas found in pediatric practice are associated with seborrhea. The clue to this causative factor will be found about the ears and upon the scalp, or perhaps in the fact that the "cradle cap" was of long duration. The ear signs may be a dry exfoliation or an exuding surface where the pinna join the scalp or beneath the lobe of the ear. He finds significant the predelection of such eczemas for fat babies, whose intake of fat has been excessive. Seborrhea seems to be the predisposing cause for the proneness of eczma to localization about the head, and its tendency to involve the hairy scalp rather than the neck and chest. Zinc and other pland ointments are practically useless in these seborrheic types until to them has been added ammoniated mercury or tar, or resorcin to destroy the micro-organisms present. Of course the dietetic factor must be recognized and corrected.

Particularly does Dr. Southworth call attention to the number of minor cases of dry seborrheic eczema and to the ear and scalp manifestations in the aggravated types of facial eczema in infancy.

N. O. PEARCE.

BOOK REVIEWS

"A SHORT HISTORY OF NURSING" by Lavinia Dock, R. N. and Isabel Maitland Stewart, R. N. (G. P. Putnam's Sons, New York and London, $3.50).

This history presents to us the Alpha of nursing as an art, which is today, as ever, the finest of the arts and which calls for the highest culture, the greatest patience and most delicate tact. It requires the best, physically, mentally and morally, which it is in human power to give, and we are constantly reminded of this and realize it more fully as we trace the development of this art with the progress of history. We are happy to say that nursing has kept abreast of the times from the year 1 A. D. when Augustus Caesar reigned and Christianity opened a new era to woman. She nobly took up the work and established a systematic, intelligent and merciful care for those who were physically, mentally or morally ill. Nursing gives to woman an opportunity to use her gifts in an administrative, educational or technical position. This has been demonstrated by the progress recorded in the various pages of history and with the introduction of the Nightingale School we have presented to us the more modern methods of nursing. The present day school fashioned after this pattern, has raised its standard of requirement in an educational way and helped the nurse to better fit herself for the serious task for which her duty calls her. The twentieth century nurse has the benefit of the experiences as recorded by those arduous nurses of the past centuries who strived and succeeded in making nursing the art which it is today. It is to be hoped that the progress thus far made by private duty, public health, Red Cross and psychiatric nurses will not cease. Although State registration has been quite generally accepted and conditions greatly bettered, this art will, by its artists, not be considered perfect, nor will they be satisfield until "their good is better and their better best," and it is their aim and ambition to keep this art ever

advancing and as a helpmate of medicine. Although the Alpha of Nursing History has been presented to us we realize that the Omega may be far distant.

DOLORES M. POSCH, R. N.

"DISEASES OF THE NERVOUS SYSTEM" a Text Book of Neurology and Psychiatry by Smith Ely Jelliffe, M. D. Ph. D. and William A. White, M. D., Third Edition. Rewritten and Enlarged with 470 Engravings and 12 Plates. Lea and Febiger, Phila. and New York, 1919.

The authors have adopted a new and rather novel classification of the nervous system into three levels —a vegetative, sensiori-motor, and psychic; the vegetative to include physico-chemical reactions manifested by **hormone stimulation and inhibition** in the metabolic processes of nutrition, growth, development and involution; the next higher level or sensori-motor, the regulation of the motor apparatus of the body (the field generally described as "neurology" proper), and marked especially by the reflex *reaction;* the third and highest level the psychic, adjusts the individual to his environment and is characterized by *symbols.*

There is an elaborate scheme of methods of examination of the nervous system, and this section is to be very highly commended for its detailed descriptions and illustrations. It will come as a shock to most students of medicine to read that Raynaud's disease and erythromelalgia may be of psychic origin and that psychoanalysis is the treatment; and that attacks in epilepsy are wish fulfilments. The insanities are well described but it is disappointng that more evidence cannot be adduced for the psychic origin of such psychic disorders, and that psychoanalysis while revealing that even the wildest ravings have real basic meanings does not give us better therapeutic results than ductless gland therapy after Abderhalden tests.

It may be a questionable policy to many to find a text book giving strong adherence to one side of subjects just now so strenuously debated, but in the opinion of the reviewer this is just as justifiable in a text book as in an essay, because while future advances in knowledge will reject much or all of present contentions, the present status of our knowledge is hereby mirrored; and when will we arrive at the time that anything in medicine is definitely settled?

Take it all in all this book is probably the most valuable text book extant today.

HALDOR SNEVE.

REGIONAL ANAESTHESIA, by B. Sherwood-Dunn, M. D. (F. A. Davis Company, Philadelphia, $3.50).

The author in this book presents, in a very concise and intelligent manner, a subject which is assuming larger proportions almost daily in the surgical field. Like all innovations, regional anaesthesia may be classed as a "fad", but the author has accomplished almost the impossible.

The technique, as used by Victor Pauchets with certain modifications, is described in detail, including various types of syringes, needles and solutions used. Practically every known operation has been performed with this technique, a chapter being given over for detailed discussion of this type of anaesthesia of the following operations: cranial, of head and neck, of thorax and abdomen, of genito-urinary organs and rectum, and of extremities.

The fundamental point in the successful use of this type of anaesthesia is an accurate knowledge of the anatomy of the nervous system. The author advocates anaesthesia induced at the "point of exit" of the nerve from the cranium or spinal column.

The manner of presentation, the discussion of the smallest details and the large number of illustrations, charts and diagrams, make this work one almost invaluable to the modern surgeon.

C. K. WILLIAMS.